HEARTS AND MINDS THROUGH HANDS ONLINE:
A NARRATIVE ANALYSIS OF LEARNING THROUGH CO-REFLECTION
IN AN ONLINE ACTION RESEARCH COURSE

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAI'I IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
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By
Joyce Yukawa

Dissertation Committee:

Violet H. Harada, Chairperson
Curtis P. Ho
Diane Nahl
Helen B. Slaughter
Daniel D. Suthers
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I would first like to express my heartfelt gratitude to the participants in this study who allowed me to share their journeys. “Ruth” and “Sarah” are remarkable women for whom I have deep respect. I learned from them in ways that go far beyond this study, and I am a better teacher and co-learner now because we learned together. The high school students and school library media staff were gracious, adventurous, and cooperative. Without them, this journey would never have begun.

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My family and friends both near and far have been a constant source of encouragement, vitality, and perspective (“get a life!”). Lastly, I say thanks to “Dear Andy” for always being there.

I dedicate this dissertation to my parents, Bill and Kiyo Yukawa, who bequeathed to me skills from lives of struggle – be honest (especially with yourself), humble, compassionate, think clearly, persevere, follow your dreams, and never lose faith. It has never been clearer to me how special they are.
ABSTRACT

This case study examines the learning processes in an online action research course facilitated by the researcher. Two graduate students in the Library and Information Science Program, University of Hawai‘i at Mānoa, studied action research and applied their knowledge to independent research projects. The purpose of the study was to examine the co-construction of knowledge and how affect and interaction influence participant understanding of action research. The original research questions were: (1) What are the key cognitive, affective, and interactional elements of the online conversations? (2) How do student-instructor interactions influence student understanding in the action research course? (3) How do student-instructor interactions influence course development? Based on the findings, these questions were modified to include the narrative aspects of learning. The online workspace was created using wiki-style collaborative software, with added email and chat programs. Using these tools, the graduate students created a substantial body of online written artifacts describing their learning that provided rich data to answer the research questions.

Three key narratives were used to explicate learning as a holistic process: (a) a primary narrative focused on course learning objectives; (b) a reflection sub-narrative focused on unique learner outcomes within the course framework; and (c) a co-reflection sub-narrative focused on the co-construction of knowledge. Reflection (an individual critical thinking process) and co-reflection (an intersubjective critical thinking process) played key roles in learning action research. Seven key features of reflection constituted the plot of the most significant individual learning narratives. Co-reflection draws on individual reflection and involves four interactional characteristics. While the value of active co-reflection is clearly recognizable in intentional dialogue and interactive problem solving, it is argued that a more tacit form of co-reflection also operates to achieve intersubjective understanding and knowledge co-construction.

Regardless of type, the evidence shows that co-reflection played a central role in the learning transformations of the students and the instructor. Co-reflection is mediated by language, broadly construed to include all meaningful signs. The different co-reflection narratives described in this study provide detailed records of the evolution of socially constructed knowledge and collaborative meaning making with affective, cognitive, and interactional dimensions. It is proposed that co-reflection is a core activity in the
processes of group cognition. As an emerging concept, co-reflection provides fertile ground for further investigation. It is also proposed that types of reflection may be associated with types of co-reflection, epistemological stances, and research approaches. Further research in both face-to-face and online contexts is needed to investigate the components and associations represented in the typology.

The pedagogical framework used to design the course was adapted from Gordon Wells' (1999) dialogic inquiry process: individuals use experience, knowledge, and information to co-construct knowledge and create, use, and improve representational artifacts. Based on the findings, this was revised as a narrative framework – the Dialogic Inquiry & Co-Reflection Framework – to represent the holistic, multidimensional nature of learning as a dynamic process. The framework features: (1) a learning narrative focused on transformations in frames of reference leading to higher self-efficacy related to the learning objectives; (2) co-reflection as a core activity; (3) a recognition of the importance of affect and relationship building in supporting co-reflection; and (4) the learning facilitator as co-learner. Because there were only two students in this study, further research is needed to shed light on the applicability of the framework for other students, larger groups, and different learning environments.

The findings of this study indicate that online learning of action research is effectively supported by: (1) field-based, inquiry learning; (2) instructor understanding of the learners' backgrounds, frames of reference, learning styles, and types of reflection and co-reflection; (3) a learning philosophy that values constructivist learning, affect, relationship building, the development of self-efficacy, and empowerment; (4) online facilitation and mentoring skills; and (5) social software. The combination of simple, flexible software tools used in the course effectively supported complex learning processes by allowing novice users to focus their learning efforts on course content rather than software features, and to adapt and augment learning and communication strategies from their face-to-face experiences. Such strategies include skills in critical thinking, co-reflection, motivational support, and relationship building, as well as facilitative strategies for ensuring that learning is a whole-person activity with the ultimate goals of learning transformations and empowerment.

Conducting the research and implementing the course involved the negotiation of choices involving five core tensions: (1) learning subject matter or technology features; (2) using social resources or
technology functions to support learning; (3) teaching as instruction or facilitation; (4) balancing co-learner differences; and (5) using face-to-face or online media for collaboration. The study recommends the development and use of social software to support learning, based on the argument that human creativity and other social resources enable co-learners (students and learning facilitators) to adapt simple, flexible software to achieve learning tasks and collaborations. The study also recognizes the importance of respecting and developing a diversity of approaches to reflection and action research. Finally, to mitigate the costs to sociability inherent in online media, the study recommends small class sizes for online professional development activities, face-to-face meetings where possible, and telementoring or peer coaching.

Narrative analysis was used to interpret the data for three reasons: (1) the narrative is a basic form for making meaning from human experience; (2) the individual learners were unique in background, learning style, and goals; and (3) the flexibility and ease of use of the social software encouraged users to adapt and innovate. Learning is itself a narrative focusing on changes in frames of reference. Both students used narrative as a conceptual artifact to scaffold their learning – Ruth in the form of extended metaphors and Sarah as concrete stories from her past. Stories were both individually and socially constructivist. Though the students were exposed to the same course content, presentation, and assignments, they used these resources in markedly different ways. Because of the complexities of socially constructed knowledge, other analysis methods failed to reveal significant discovery processes driving knowledge construction. The focus on human action and agency afforded by narrative analysis provided a means to apprehend and interpret these richly different learning experiences. The simple software tools provided a record of the evolution of socially constructed knowledge. Narrative analysis offered a theoretical framework for elucidating the processes underlying that evolution. This work suggests that evaluations of learning in which students have a significant role in creating written artifacts of their experiences can benefit from the use of narrative analysis.
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CHAPTER 1. INTRODUCTION

INTRODUCTION

Online collaborative learning is currently the focus of considerable attention due to the opportunities offered by the widespread use of the internet and the demand caused by the changing educational and workforce needs of a diverse and geographically distributed audience of learners. Assessments of online learning by researchers, designers, providers, and consumers are ambivalent. While technological advances make online learning increasingly viable, questions are being raised about its effectiveness. One of the issues being increasingly recognized by the computer supported collaborative learning community as central in the debate is the proper balance of socio-cultural processes and technical infrastructures to support learning by diverse learners. Against this background, this study illuminates the socially constructed nature of online learning through a close examination of the experiences of adult learners in an online action research course that used simple, flexible software. The study also demonstrates the value of action research as a professional development tool for educators.

BACKGROUND

The widespread use of the internet has made distance education attractive to students, educators, administrators, policy makers, commercial firms, and funding agencies. According to a recent GAO report (U.S. GAO, 2004: 7), “Studies by [the Department of] Education indicate that enrollments in distance education quadrupled between 1995 and 2001. By the 2000-2001 school year, nearly 90 percent of public 4-year institutions were offering distance education courses.” Similarly, a 2003 Sloan Consortium report (Allen and Seaman, 2003: 23) predicted an overall growth rate of almost 20% in the number of students studying online from Fall 2002 to Fall 2003. Traditionally viewed as supplemental to face-to-face formal and informal educational opportunities, courses offered through the internet are playing a larger role as the primary means by which degree programs are offered (e.g., University of Phoenix Online). Online courses are often advertised to students as easy and convenient – courses are accessible “anywhere, anytime.” Those responsible for providing education often see online education as a cost-effective means of providing courses and training.
Demographic and societal changes are also fueling an increased demand. The Web-Based Education Commission (WBEC) (2000) gave attention to the practical pressures for increased online education: increased student enrollment, teacher shortages, changing post-secondary student populations, and the need for continuous training of the workforce. The WBEC also gave heed to the digital divide – the gap that exists between those who have and those who do not have access to telecommunications technology – and called for a national agenda to improve educational research and the technological infrastructure to fulfill the promise and power of the internet to support individual-centered, lifelong learning.

Whether online education can be provided on a wide scale is no longer at issue. The question now becomes whether online learning is worthwhile. Many have questioned the quality of online education. Although no national statistics exist about distance education completion rates, according to Carr (2000: 1), "anecdotal evidence and studies by individual institutions suggest that course-completion and program-retention rates are generally lower in distance-education courses than in their face-to-face counterparts ... [some] finding that fewer than 50 percent of distance-education students finish their courses.” The Sloan Consortium report (Allen and Seaman, 2003: 23-24) found that a majority of Academic Officers at institutions of higher education believe the learning outcomes in online courses will equal or exceed that of face-to-face courses within three years,” but “overall, attitudes of Faculty at all schools (as perceived by academic leaders at those institutions) remain more conservative with regard to the quality of online education and its ability to equal face-to-face learning.”

The interactivity possible using the internet brings inevitable comparisons to face-to-face classroom interactions. Prior to undertaking this research, my teaching experience had been primarily with adult learners in classrooms or hybrid learning environments, using online tools to support face-to-face work. I taught graduate level courses in the Library and Information Sciences Program, University of Hawai‘i at Mānoa, for several years, as well as working as a librarian and English-as-a-Second Language teacher in Asia for many years prior to that. The central goals of my teaching have always been learner-centered instruction, respect for individual learner differences, and a belief in the value of open and trusting relationships among students and teachers. Pair work and small group work have been an important part of both my teaching and learning. I have always felt I was a co-learner with my students.
As a student, the instructional environments I have valued most are those in which the instructor, whether presenting the course material in a highly structured or relatively unstructured way, demonstrated both expertise and a passion about the subject itself; respected me as a learner; and was accessible to and interacted with students, either during the class or during office hours. The teachers I valued most were people I could respect and trust. The learning experiences I have valued most were those in which I reflected, saw new things, and was in some important way transformed. The best of my teaching and learning experiences have been cognitive, affective, social, and transformational.

Thus, in my experience in face-to-face learning environments, I have found that the processes of learning and communication have been dynamic, complex, and holistic. Could the essence of good learning in face-to-face environments (as I perceived it) be accomplished in the online environment? This was my essential question. I sought answers first from others.

Though distance education has a well-established history and literature, online learning is the primary focus of the newly emerging discipline of computer supported collaborative learning (CSCL). Since the mid-1990's, CSCL research has grown dynamically. CSCL's educational underpinnings are constructivist learning approaches, including inquiry-based and problem-based learning. Inquiry learning is an active process initiated by students who seek to answer questions meaningful to their own lives. As numerous educators have emphasized, the first step is the art of asking questions that are meaningful, engaging, provocative, and conceptually challenging (e.g., Cecil, 1995; Pearce, 1999; Short et al., 1996). Inquiry learning has been described as the essence of learning, or learning how to learn.

A great deal of research effort has been focused on the cognitive aspects of CSCL. The use of electronic artifacts, scaffolding, visualization, and simulations are examples of this kind of research (e.g., Moher et al., 2002; Suthers and Hundhausen, 2002; Sutter, 2002; Wu et al., 2002). Though some studies have investigated the role of motivation in successful online learning and looked at the subjective factors in collaboration (e.g., Martinez, 2001; Sorg, 2000; Sunderland, 2002), the affective dimension in online communication has received substantially less research attention.

Communication and learning theories and research take into account the social and emotional dimensions of learning, such as self-efficacy, dialogic inquiry, co-construction of knowledge, perception,
motivation, attitude, attribution, values, beliefs, and judgment (e.g., Bandura, 1997; Bruner, 1990; Mercer, 1995; Sinatra and Pintrich, 2003b; Vygotsky, 1978; Wells, 1999). Theories and models of communication as it takes place in relationships point out the importance of emotional content in the development of interpersonal and group relations. When juxtaposed against such work, the scarcity of CSCL research on the affective dimension suggests the need for more research attention, if computer tools are to reach their full potential to support effective collaborative learning online.

Some online educators have placed the social and emotional dimensions of learning at the core of their practice. Palloff and Pratt (1999) focus on the fundamental importance of community building in the online classroom based on their extensive experience with distance education for adults. They highlight six “keys to success in distance learning”: (1) honesty, (2) responsiveness, (3) relevance, (4) respect, (5) openness, and (6) empowerment.

When educators form online learning communities among themselves, the same keys to success seem to apply. As Suthers et al. (2004: 1) have noted: “Trust building is an essential feature of online engagement.” In fact, Barab, MaKinster, and Scheckler (2003) have found that a web-supported teacher community must focus on issues of sociability more than usability. Similarly, in working with TappedIn, Schlager and Fusco (2003) state that the software should be flexible enough to support informal professional development activities such as mentoring and coaching.

Trust building is also one of the design principles espoused by Wenger, McDermott, and Snyder (2002), which have become a staple among those planning online communities: (1) design for evolution; (2) invite different levels of participation; (3) develop both public and private community spaces; (4) create a rhythm for the community; (5) build trust and personal relationships; and (6) maintain community visibility. Olson and Olson (2000: 168) note that in computer supported collaborative work environments, trust is an important precursor to establishing common ground and more difficult to attain online than in face-to-face situations. “Remote teams have been reported to be less effective and reliable than face-to-face teams … when people communicate by text only, they tend to develop more self-serving stances [than when communicating face-to-face]” (op cit.).
Some recent writings in CSCL have addressed the importance of the human side of human-computer interaction in online learning in higher education. Goodyear et al. (2004: 3) state that because online learning (or networked learning, in their terms) does not have a long history, it is particularly important for empirical research to be clear about research goals and “try to explicate the connections between course activity and more deep-seated pedagogical intentions. Without such clarity, it can be hard to understand why a particularly successful (or failing) episode of collaborative activity is important.”

The conclusions of others working with online learning and online communities were similar to mine – that trust building is an important part of online learning and that the educational and social infrastructures and resources that are basic to learning success should drive the use of the software. Since 2002, the term “social software” has been used to indicate software that supports social interactions.¹ Clay Shirky, the originator of the term, defines it as "software that supports group communications."² Tom Coates (2002) proposes three functions of social software: “(1) removing the limitations placed on social contact by external factors such as language and geography; (2) compensating for the overloads that this removal of limitations might generate; and (3) uncovering and improving on the mechanisms that people use in their social interactions with one another – making rational decisions about which are still appropriate and which can be replaced by software or technology.”

This exploratory case study was essentially an investigation of these ideas. An online course was designed and implemented by a learning facilitator who believes in the importance of social resources and social software, and used the simplest, most flexible online software available. Thus, I began my study with these assumptions based on personal experience and a review of the literature:

- Learning is a whole-person activity, involving cognitive, affective, and social dimensions.
- Knowledge is socially constructed.
- Relationship building based on respect, trust, and sincerity is as fundamental to online learning environments as it is to face-to-face environments.
- Empowerment is an important goal of learning.
- The social means to achieve these ends should be supported by social software, rather than predetermined by software functionality.

² http://www.shirky.com/writings/group_politics.html
PURPOSE OF THE STUDY

This case study focuses on the learning experiences of two graduate students in an online action research course conducted by the researcher in Spring 2004. The aim of the course was to provide an opportunity for the graduate students to learn how to do action research and apply it to their experiences as telementors to two high school students, also conducting research projects.

The purpose of this study was to examine how the co-construction of knowledge occurs in an online action research course and how it contributes to student understanding of action research. The study identifies and describes key cognitive, affective, and interactional aspects of learning as a holistic process and explores the effect of interaction on student learning progress and the attainment of higher self-efficacy. Of broader interest are the implications for the development of online learning environments from a social constructivist perspective.

Action research is a rigorous form of inquiry learning that fosters a reflective, critical thinking mindset and provides methods and tools that enable practitioner-researchers to understand, investigate, and improve their own practice based on evidence. Doing action research is a form of empowerment. Practitioner-researchers develop their own ideas and co-construct knowledge in collaboration with others about questions and issues rooted in their own desire for improvement.

RESEARCH QUESTIONS

The research questions were broadly posed in order to uncover the important factors related to knowledge co-construction and its effect on learning progress. The guiding research questions were:

- What are the key cognitive, affective, and interactional elements of the online conversations?
- How do student-instructor interactions influence student understanding in the action research course?
- How do student-instructor interactions influence course development?

OVERVIEW OF THE STUDY

To explicate the findings, the interdisciplinary nature of this study required explorations of constructivist learning, teacher professional development, mentoring, and the use of technology for collaborative learning. Chapter 2, “Review of the Related Literature,” prepares the foundation for the case study by
examining key theories, research, and practices in these areas, with a particular attention to the affective
dimension and relationship building. Based on a review of the literature, I constructed a holistic learning
framework to guide the design of the online course and organize data collection for this research. The
framework is introduced in Chapter 2.

Chapter 3, "Methodology," presents the rationale for the use of narrative analysis and discusses the
method's main features, analysis and interpretation issues, advantages and disadvantages, and procedures.
Story grammars developed to analyze the individual student cases are defined.

Chapter 4, "Graduate Course in Action Research," describes the background, structure, content, and
evolution of the online action research course, as well as the software used to implement it. The aim of the
course was to give the graduate students an opportunity to learn about action research and apply its
concepts and methods to their telementoring of two high school students.

Chapters 5 and 6 present the individual cases using rich descriptions of the unique learning
experiences of the two graduate students. The chapters are structured by the elements of the story grammars
developed in Chapter 2. Each chapter ends with a case analysis that addresses the key cognitive, affective,
and interactional aspects of the individual and social processes of knowledge construction and how student-
instructor interactions influenced co-learner understanding of action research.

Chapter 7, "Findings and Discussion," discusses the major findings of the study that address the
research questions. First, it presents a narrative learning framework that incorporates revisions to the
holistic learning framework introduced in Chapter 2. Second, it addresses the three research questions using
this framework to organize the subsequent discussions of the study's findings.

Chapter 8, "Conclusions and Recommendations," discusses the study's contributions to research and
practice and makes recommendations for the study and use of collaborative reflection in professional
development, the application of narrative analysis to research and teaching, and the negotiation of core
tensions among human and technological factors in online learning.
KEY TERMS

Action Research

Action research is defined in numerous ways and utilizes a wide range of approaches and methods. It is closely related to and often used synonymously for practitioner research, teacher research, reflective practice, and participatory action research. McKernan (1996: 5) offers this concise definition, which attempts to find a middle ground among positivist approaches favoring quantitative methods and naturalistic, constructivist approaches favoring qualitative methods: “Action research is the reflective process whereby in a given problem area, where one wishes to improve practice or personal understanding, inquiry is carried out by the practitioner – first, to clearly define the problem; secondly, to specify a plan of action – including the testing of hypotheses by application of action to the problem. Evaluation is then undertaken to monitor and establish the effectiveness of the action taken. Finally, participants reflect upon, explain developments, and communicate these results to the community of action researchers. Action research is systematic self-reflective scientific inquiry by practitioners to improve practice.” Others note that action research is also empowering (McNiff, 2002), emancipatory (Kemmis and McTaggart, 1988), unusually creative (Dadds and Hart, 2001), and intensely personal (Mason, 2002).

Co-Construction of Knowledge

Co-construction of knowledge refers to knowledge that is interactively attained in discourse (broadly construed to include all meaningful signs) through a synergy of individual ideas and perspectives that results in a whole greater than the sum of these parts. Learning involves both individual and group processes, and the analyses of learning in this study focus on reflection as an individual critical thinking process and co-reflection as an intersubjective, social critical thinking process. There is considerable interplay between them. It is generally the conceptual products of knowledge co-construction that are later presented publicly as information. Knowledge co-construction usually “involves constructing, using and progressively improving representational artifacts of various kinds with a concern for systematicity, coherence and consistency” (Wells, 1999: 89).
Collaborative Meaning Making

Collaborative meaning making is closely related to co-constructing knowledge. The distinction made in this study is that collaborative meaning making indicates more strongly the affective significance of the collaborative learning process, while knowledge co-construction deals more strongly with the intellectual or conceptual aspects. Individuals engage in meaning making with others in an attempt to extend and transform their collective understanding and appreciation with respect to some aspect of a jointly undertaken activity. Collaborative meaning making involves engaging values, negotiating beliefs, and developing mutual frames of reference to guide group action. In online collaborative learning, the products of the co-construction of knowledge and collaborative meaning making persist in the records of online communication and artifacts created and refined during the process.

Co-Reflection

Co-reflection is a collaboratively undertaken reflective process, defined as the intellectual and affective activities in which two or more individuals engage to explore their experiences in order to lead to new intersubjective understandings and appreciations. This definition is an extension of the definition of reflection developed by Boud et al. (1985a). Characterizing affect in terms of activity and interaction clarifies that, through emotions, one participates more deeply and personally in the collaborative critical thinking process. To respect, to trust, and to show sincerity, for example, are affective activities in this conception. Co-reflection uses some or all of the seven key features of reflection (see “Reflection” below) and, in addition, exhibits four interactional characteristics: (1) sharing of experience and relevant information; (2) achievement of intersubjective understanding through collaborative meaning making; (3) synergy between relationship building and co-reflection based on respect, trust, sincerity, and concern; and (4) teacher as co-learner.

Through co-reflection, individuals collaboratively weigh reasons, arguments, and supporting evidence and examine alternative perspectives to achieve a clearer understanding by drawing on collective experience (Mezirow, 2000: 10-11). The goal is to transform frames of reference to make them better guides for action (see “Transformative Learning” below). The affective dimension plays a key role in co-reflection, because effective participation in co-reflection requires emotional maturity (awareness, empathy,
knowing and managing one's emotions, motivating oneself, recognizing emotions in others, and handling relationships) as well as clear thinking (op cit.).

**Group Cognition**

Group cognition refers to cognition that takes place primarily in group processes of interpersonal interaction (Stahl, forthcoming). In Stahl’s view, group cognition is seen as having broad dimensions:

It is a social product of the interaction of groups—not primarily of individuals—discussing and acting in the world in culturally mediated ways. Individuals who are socialized into the community learn to speak and understand language as part of their learning in order to participate in that community. In the process, they internalize the use of language: e.g., as silent self-talk, internal dialog, rehearsed talk, narratives of rational accountability, senses of morality, conflicted dream lives, habits, personal identities and their tacit background knowledge largely preserved in language understanding. In this story, cognition takes place primarily in group processes of inter-personal interaction, including mother-child, best friends, husband-wife, teacher-student, boss-employee, extended-family, social network, gang, tribe, neighborhood, community of practice, etc. The products of cognition—thoughts—exist in discourse, symbolic representations, meaningful gestures, patterns of behavior; they persist in texts and other inscriptions, in physical artifacts, in computer databases, in cultural standards and in the memories of individual minds. Individual cognition emerges as a secondary effect, although it later seems to acquire a dominant role in our introspective narratives. (op cit.; italics added)

Stahl discusses shared meaning making in terms of the cognitive qualities of interactions—thoughts. Suthers (forthcoming) discusses “the interactional accomplishment of intersubjective learning in small groups.” Both authors use the term “social interaction” to indicate primarily collaborative cognitive activities. As discussed in Chapter 2, I take a broader meaning of the term “social interaction,” including not only the co-construction of knowledge as a collaborative intellectual activity, but also the affective qualities and activities involved in relationship building, particularly where mentoring takes place. The results of these collaborative intellectual and affective interactions are new intersubjective understandings and appreciations.

**Intersubjective Understanding**

Intersubjective understanding refers to the results of the processes of co-constructing knowledge and collaborative meaning making that is deeper, more personal, and more immediate than the public products of these processes. In his sociocultural theory of education, Gordon Wells positions understanding as the goal of education and defines it as the result of collaborative meaning making:

Understanding differs from knowledge building in being more personal and immediate. Whereas the latter, of necessity, requires that meaning should be made explicit, understanding is typically more
holistic and intuitive; and where knowledge building is often temporarily detached from primary
activity, understanding is deeply implicated in action, as it occurs, since it is in terms of our
understanding of the possibilities for, and constraints on, action in a setting that we decide how to act.
Put more generally, it is our understanding that constitutes the interpretive framework in terms of
which we make sense of new experience and which guides effective and responsible action. Thus,
although first-hand experience provides an essential basis for understanding, it needs to be extended
and reinterpreted through collaborative knowing, using the informational resources and
representational tools of the wider culture. (ibid., p. 84-85)

While this view of understanding recognizes the collaborative nature of this achievement for the individual,
intersubjective understanding at its deepest levels can be considered a mutually constructed frame of
reference that is deeply implicated in mutual action and that helps group members make sense of new
experience within the group context. Such understanding guides effective and responsible mutual action.

Learning Narratives

Learning narratives are descriptions of the learning process in narrative form. A learning narrative is a plot
and the discourse that describes the sequential and consequential events that lead to one or more learning
transformations (see “Transformative Learning” below). A primary learning narrative is “a narrative the
narrating instance of which introduces one (or more than one) other narrating instance and is not itself
introduced by any” (Prince, 2003: 78). The primary learning narrative can introduce one or more learning
sub-narratives. As noted by Prince (op cit.), “a primary narrative is not necessarily more important or
interesting than the one(s) it introduces; indeed, the opposite is often true.” The learning narratives
presented in this study are based on natural narratives rather than deliberately constructed stories. A natural
narrative is a “narrative occurring spontaneously in ‘normal’ everyday conversation. The term is supposed
to distinguish narratives produced without deliberation (‘naturally’) from narratives that have a
‘constructed’ character and appear in specific story-telling contexts” (Prince, 2003).

Reflection

John Dewey defined reflective thought as “active, persistent, and careful consideration of any belief or
supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which
it tends … it is a conscious and voluntary effort to establish belief upon a firm basis of reasons” (Dewey,
1997: 6). Based on Dewey, Boud et al. (1985a), and Mason (2002), I identify the following as key aspects
of reflection: (1) being confronted with a challenging question or situation, (2) dealing with
feelings/emotions related to the challenge, (3) bringing experience into the thinking/reflecting process, (4) reframing perspective through bridging the concrete and the abstract, (5) making a leap of thinking, (6) integrating the new knowledge cognitively and affectively, (7) with implications for future action. Steps 2 and 3 may occur simultaneously or in reverse order.

**Self-Efficacy**

Self-efficacy is belief in one’s capabilities to produce desired effects by one’s actions (Bandura, 1997: vii). Perceived self-efficacy is “a judgment of one’s ability to organize and execute given types of performances” (ibid., p.21). This is differentiated from the concept of self-esteem, which refers to judgments of self-worth (ibid., p.11). The efficacy belief system consists of different sets of self-beliefs that operate in different areas of functioning (ibid., p.36). Self-efficacy beliefs produce effects through four mediating processes: cognitive, motivational, affective, and selection processes (ibid., Chapter 4).

Self-efficacy is one component in Albert Bandura’s social cognitive theory (1986, 1997). From the perspective of this theory, he describes the key role that self-efficacy plays in learning and skills acquisition: “Social cognitive theory encompasses a large set of factors that operate as regulators and motivators of established cognitive, social, and behavioral skills … Perceived self-efficacy occupies a pivotal role in social cognitive theory because it acts upon the other classes of determinants. By influencing the choice of activities and the motivational level, beliefs of personal efficacy can make an important contribution to the acquisition of the knowledge structures on which skills are founded” (Bandura, 1997: 34-35).

**Social Software**

Social software is software that supports group interaction for the purposes of augmenting socializing and networking abilities, compensating for the overloads this might engender, and uncovering and improving on the mechanisms that people use in their social interactions with one another involving rational decisions about which are still appropriate and which can be replaced by software or technology (Coates, 2002).
Telementoring

Telementoring is defined as using telecommunications technology to develop and sustain mentoring relationships where face-to-face ones would be impractical or unlikely (O’Neill, 2002). Telementoring is advantageous when intellectual guidance for students is not otherwise available. It is not a replacement for traditional face-to-face mentoring but a unique form of mentoring relationship.

Transformative Learning

According to Jack Mezirow, the originator of transformative learning theory, the goal of learning is to “transform our taken-for-granted frames of reference ... to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action” (Mezirow, 2000: 8). Mezirow identifies four types of learning transformations: (1) elaborating frames of reference, (2) learning new frames of reference, (3) transforming points of view, or (4) transforming habits of mind (ibid., p. 19-20).

A frame of reference is a “meaning perspective, the structure of assumptions and expectations through which we filter sense impressions,” that involves cognition, affect, and conation (ibid., p. 16). A frame of reference is composed of two dimensions, a habit of mind and resulting points of view. A habit of mind is “a set of assumptions – broad, generalized, orienting predispositions that act as a filter for interpreting the meaning of experience.” These can include philosophical, moral-ethical, aesthetic, epistemic, and psychological assumptions. A habit of mind becomes expressed as a point of view that “comprises clusters of meaning schemes – sets of immediate specific expectations, beliefs, feelings, attitudes, and judgments – that tacitly direct and shape a specific interpretation and determine how we judge, typify objects, and attribute causality” (ibid., p. 17).

The rest of this dissertation will be dedicated to examining in greater detail how the co-construction of knowledge occurs online, the roles of affect and interaction in the learning processes, and the implications for the development of online learning environments from a social constructivist perspective. I begin this examination in the next chapter with explorations of literature on constructivist learning, teacher professional development, mentoring, and the use of technology for collaborative learning.
CHAPTER 2: REVIEW OF THE RELATED LITERATURE

INTRODUCTION

Constructivism is the means by which we learn. We construct knowledge based on our interactions with the environment (Piaget, 1932) and with others (Vygotsky, 1978, 1986). In inquiry learning, where personal interest and authentic questions drive the learning process, self-efficacy is one of the most important individual tools we have to enable ourselves to be more powerful and efficient learners and social actors (Bandura, 1997). Learning, with its by-product of knowledge building, is a necessarily a collaborative process (Wells, 1999), shaped and enabled by the use of technology when done online.

This chapter begins with a review of constructivist learning theories to set the foundations for important concepts related to action research. Emphasis is placed on inquiry learning as discourse in the form of dialogic inquiry (Wells, 1999) and as transformative learning among adults (Mezirow, 2000). Particular attention is paid to work that reflects the important roles played by the affective and social dimensions. This is followed by an overview of the current thinking about action research for teacher professional development that view reflection as central. The chapter ends with a review of important issues related to the use of online media for collaborative learning. The aim is to place this study in a broader context and to build a foundation based on the insights from theory, research, and practice.

CONSTRUCTIVIST LEARNING THEORIES

Departing from the early behaviorist orientation of instruction, contemporary learning theories lean heavily toward constructivist ideas. Constructivism is pervasive not only in theory but in educational practice and teacher preparation, particularly associated with inquiry learning. Deborah Walker (2002: 26-28) provides a succinct summary of constructivist principles in education: (1) Knowledge and beliefs are formed within the learner. (2) Learners personally imbue experiences with meaning. (3) Learning activities should cause learners to gain access to their experience, knowledge, and beliefs. (4) Culture, race, and economic status affect student learning individually and collectively. (5) Learning is a social activity that is enhanced by shared inquiry. (6) Reflection and metacognition are essential aspects of constructing knowledge and
meaning. (7) Learners play a critical role in assessing their own learning. (8) The outcomes of the learning process are varied and often unpredictable.

Constructivism in education has its roots in John Dewey’s (1916) ideas of progressive education based on learning through inquiry and experience, combined with insights on cognitive development put forth by Jean Piaget (1832), Lev Vygotsky (1962; 1978), Jerome Bruner (1966), and others. Learners interact with the physical and social world to actively create rather than passively receive knowledge. Bruner’s recent work on cultural psychology and education strongly emphasizes the social and cultural nature of learning (1996: xi): “We are the only species that teaches in any significant way. Mental life is lived with others, is shaped to be communicated, and unfolds with the aid of cultural codes, traditions, and the like.”

**Inquiry Learning**

Inquiry learning is most often associated with curricula from kindergarten through high school but is increasingly being used to describe forms of adult education (e.g., Wells, 2002). Inquiry learning is an active process initiated by students who seek to answer questions meaningful to their own lives. The process is generally understood to include asking a question or posing a problem, connecting to one’s own experience, exploring background information, focusing or hypothesizing, investigating answers, analyzing and interpreting data and information, and communicating new understandings. But, as Stripling (2003: 4) notes, “inquiry is much more than simply following a process. It is an essence of teaching and learning that places students at the heart of learning by empowering them to follow their sense of wonder into new discoveries and insights about the way the world works.” The foundations for inquiry learning were set forth by Dewey, who equated the learning experience with thinking and reflection in authentic experiences chosen by the learner.

The inquiry learning approach has its roots in the scientific inquiry process but has spread throughout the K-12 curriculum. Throughout the process, students ask questions that are meaningful, engaging, and conceptually challenging. Because their own curiosity drives their investigation, the process is open-ended, recursive, and unpredictable. Their exploration involves finding sources of information appropriate to their question, working to understand and evaluate the information, and then applying this understanding in a
productive way. Students not only initiate the process by asking questions and seeking answers but are also responsible, to varying degrees, for setting learning goals and monitoring every aspect of their own learning process through final assessment. Reflection is thus a critical skill at every stage of inquiry learning.

**Dialogic Inquiry**

Given the importance of language in communication and constructivist learning, it is not surprising that some educationists have begun developing theories about the use of dialogue and guided conversation as the primary means of inquiry learning (e.g., Edwards, 1991; Lindfors, 1999; Mercer, 1995; Wells, 1999).

Gordon Wells (1981, 1999, 2001, 2002) has developed the concept of “dialogic inquiry” that is at the core of his work “toward a sociocultural practice and theory of education” (1999). His basic argument is “that education should be conducted as a dialogue about matters that are of interest and concern to the participants” (1999: xi). He integrates ideas from Vygotsky and M.A.K. Halliday about the role of language in learning, teaching, and personal development. From Vygotsky’s sociocultural theory, he takes the key idea of the importance of discourse in learning and teaching. From Halliday, he finds the specifics of how language operates as “social semiotic,” in which language simultaneously creates and is created by culture: “Although the way in which we interpret the context of a situation largely determines what we say, it is also true that what we say plays a part in determining the situation” (ibid., p. 10). Another aspect of this reciprocal relationship is that through discourse, individuals create society and are influenced by society to develop their own personalities and identities.

Wells proposes a sociocultural model of knowing that emphasizes the process of coming to know, which progresses through an interactive spiral of experience, information, knowledge building, and understanding. *Experience* refers to “an individual’s culturally situated, affectively charged, participation in the multiple communities of practice that constitute his or her life-world” (ibid., p. 84). *Information* is “second hand. It consists of other people’s interpretations of experience and the meanings that they have made and is encountered in many genres, from casual conversation to works of art and from brochures to authoritative printed works of reference” (op cit.). *Knowledge building* “also deals with meanings in the public domain but, by contrast with information, involves a much more active and integrative stance. Here, the individual is engaged in meaning making with others in an attempt to extend and transform their
collective understanding with respect to some aspect of a jointly undertaken activity” (op cit.). Knowledge building usually “involves constructing, using and progressively improving representational artifacts of various kinds with a concern for systematicity, coherence and consistency” (op cit.). Understanding is different from both experience and knowledge building. Understanding goes beyond experience by way of the mediation of collaborative knowing:

Understanding differs from knowledge building in being more personal and immediate. Whereas the latter, of necessity, requires that meaning should be made explicit, understanding is typically more holistic and intuitive; and where knowledge building is often temporarily detached from primary activity, understanding is deeply implicated in action, as it occurs, since it is in terms of our understanding of the possibilities for, and constraints on, action in a setting that we decide how to act. Put more generally, it is our understanding that constitutes the interpretive framework in terms of which we make sense of new experience and which guides effective and responsible action. Thus, although first-hand experience provides an essential basis for understanding, it needs to be extended and reinterpreted through collaborative knowing, using the informational resources and representational tools of the wider culture. (ibid., p. 84-85)

Because, in this model, understanding is not possible without collaborative learning, creating classroom learning situations and classroom communities of dialogic inquiry are essential. Wells takes theory into practice by introducing a “discourse tool-kit” that focuses on what can be done in the classroom to encourage inquiry learning through dialogue that is broadly construed as both oral and written. The basic pattern of oral discourse is triadic dialogue: Teacher Initiation, Student Response, and Teacher Follow-up (ibid., Chapter 5). This is taken from the Initiation-Response-Feedback (IRF) exchange structure identified as speech acts in discourse analysis (Nassaji and Wells, 1999). Using triadic dialogue and Vygotsky’s concept of the zone of proximal development (zpd), the teacher scaffolds dialogic inquiry so that students can reach the level of understanding that goes beyond experience, information, and knowledge building.

In this model of education, the role of the teacher is more than selecting and delivering a standardized curriculum, followed by assessment: “Teaching certainly involves preparation, instruction and assessment; but to be truly effective it also involves the ongoing co-construction of each student’s zpd and on-the-spot judgments about how best to facilitate his or her learning in the specific activity setting in which he or she is engaged” (1999: 129). Importantly, this also requires the affective: “Learning in the zpd involves all aspects of the learner and leads to the development of identity as well as of skills and knowledge. For this
reason, the affective quality of the interaction between participants is critical. Learning will be most successful when it is mediated by interaction that expresses mutual respect, trust and concern" (1999: 133).

What are the implications of Wells' view of knowledge and understanding for educational practice? The need for knowledge building through social interaction challenges the simplistic view of education as the efficient transmission of information. His concept requires that intellectual development take place through students' personal engagement with a topic, other learners (students and teachers), and the broader discourses of culture and scholarship. A second challenge is to the view that the artifacts produced during knowledge building embody knowledge. He makes clear that this is not the case:

[K]nowledge does not have an independent existence, but is simply a way of referring to what is focused on in communities in which the participants, whether co-present or temporarily alone, attempt to achieve greater understanding of some aspect of an activity in which they are jointly engaged. Certainly, it is the case that material and symbolic artifacts are involved in knowing, both as mediating tools and as outcomes of the activity. However, these artifacts are not in themselves knowledge, nor do they contain knowledge in any but a metaphorical sense. Knowledge ... is not an object of any kind – material, mental, or immaterial – that exists outside particular situations of knowing; and in such situations, it does not preexist the activity but is what is recreated, modified, and extended in and through collaborative knowledge building and individual understanding. (ibid., p. 89)

According to Wells, the "truths" and beliefs that form the core of standardized curricula and assessment measures have themselves been built over centuries through holistic knowledge building processes that have not depended solely on intellectual capacities: "Not only is knowing, in all its modes, ultimately inseparable from purposeful action within a cultural framework, but it is also inherently social in its motivation and interactional in its orientation, and therefore involves feelings, attitudes, values, as well as rationally justified beliefs" (ibid., p. 90). To achieve understanding, it is not enough to be exposed to a sound curriculum: "[K]nowledge, however carefully sequenced and authoritatively presented, remains at the level of information that has little or no impact on students' understanding until they actively engage in collaborative knowledge building to test its relevance in relation to their personal models of the world and, where possible, its practical application in action" (op cit.).

Within the context of his sociocultural practice and theory of education, Wells makes four recommendations for reforming educational practice that emphasize the attainment of understanding through collaboration and dialogic inquiry: (1) Understanding, including the disposition and necessary strategies to achieve future understanding, should be made the primary goal of education. (2) Such
understanding is achieved through engaging in joint activities with others that encourage collaborative knowledge building and making and using representational artifacts in response to the problems and challenges that arise in those activities. Knowledge objects are of no value unless and until they are used as tools to mediate activity, including the activity of knowing. (3) There should be greater awareness that, outside the classroom, participation in an activity of any scope and complexity is likely to involve most, if not all, of the different modes of knowing in complementary relationships with each other. (4) Greater recognition should be given to the varied but critical roles that discourse plays in relation to modes of knowing (ibid., p. 91-92).

John Dewey would very likely agree with the theoretical foundations and pedagogical goals and methods Wells espouses. To understand learning, one must understand that mind, activity, and artifacts are inseparable:

[M]ind and intelligent or purposeful engagement in a course of action into which things enter are identical. Hence to develop and train mind is to provide an environment which induces such activity ... [the] subject matter of learning is identical with all the objects, ideas, and principles which enter as resources or obstacles into the continuous intentional pursuit of a course of action. The developing course of action whose end and conditions are perceived, is the unity which holds together what are often divided into an independent mind on one side and an independent world of objects and facts on the other. (Dewey, 1916: 137-138)

Neil Mercer (1995) calls the process of using discourse to scaffold learning “the guided construction of knowledge.” He characterizes language as a “social mode of thinking” that is a means not only for formulating ideas and communicating them, but also for thinking and learning. Moreover, “these two functions [of language], its cultural function (communicating) and its psychological function (thinking) are not really separate” (1995: 5). The teacher becomes a “discourse guide” in a “discourse village,” the classroom, using a curriculum that “embodies ways of using language – discourses – which students need to be enabled to understand and to use if they are to become educated” (ibid., p. 83-85).

The concepts of dialogic inquiry and guided construction of knowledge are at the heart of online learning and mentoring for action research. Learning relationships in such environments depend on online interactions whose goal is developing skills, knowledge, and understanding by individuals and among groups who have real questions, genuine interest in their pursuit, and a personal stake in finding answers.
**Transformative Learning Theory**

While inquiry learning and dialogic inquiry arose from the K-12 curricula, transformative learning theory was originally introduced by Jack Mezirow in 1978, based on his findings from a study of older women returning to community colleges to continue their education. Since then, the theory has had a major impact on adult education and encouraged new theory building about adult learning.

The core concepts of transformative learning are making meaning by negotiating contested meanings, using contextual understanding, critically reflecting on assumptions, and validating meaning by assessing rationales. Mezirow defines learning in a way closely related to some definitions of action research and reflective practice: “Learning is understood as the process of using a prior interpretation to construe a new or revised interpretation of the meaning of one’s experience as a guide for future action” (Mezirow, 2000: 5). With its focus on adult education, transformative learning theory’s focus “is on how we learn to negotiate and act on our own purposes, values, feelings, and meanings rather than those we have uncritically assimilated from others – to gain greater control over our lives as socially responsible, clear-thinking decision-makers” (ibid., p. 8).

Reflective discourse plays a key role in assisting learners to make these kinds of self-empowering mental transformations. Mezirow defines reflective discourse as the “specialized use of dialogue devoted to searching for a common understanding and assessment of the justification of an interpretation or belief. This involves assessing reasons advanced by weighing the supporting evidence and arguments and by examining alternative perspectives [and] … leads toward a clearer understanding by tapping collective experience” (ibid., p. 10-11). The goal is to “transform our taken-for-granted frames of reference … to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action” (op cit.).

Affect plays a key role in reflective discourse: “Effective participation in discourse and in transformative learning requires emotional maturity – awareness, empathy, and control – what Goleman (1998) calls ‘emotional intelligence’ – knowing and managing one’s emotions, motivating oneself, recognizing emotions in others and handling relationships – as well as clear thinking” (op cit.).
social competencies include empathy, social skills, and trustworthiness. Self-regulation skills also contribute to emotional maturity.

Mezirow identifies four types of learning transformations: elaborating frames of reference, learning new frames of reference, transforming points of view, or transforming habits of mind (ibid., p. 19-20). A frame of reference is a “meaning perspective, the structure of assumptions and expectations through which we filter sense impressions,” that involves “cognitive, affective, and conative dimensions” (ibid., p. 16). A frame of reference is composed of two dimensions, a habit of mind and resulting points of view.

A habit of mind is “a set of assumptions – broad, generalized, orienting predispositions that act as a filter for interpreting the meaning of experience.” These can include philosophical, moral-ethical, aesthetic, epistemic (such as learning styles or focus on the concrete or the abstract), and psychological (self-concept, personality type, emotional response patterns). A habit of mind becomes expressed as a point of view that “comprises clusters of meaning schemes – sets of immediate specific expectations, beliefs, feelings, attitudes, and judgments – that tacitly direct and shape a specific interpretation and determine how we judge, typify objects, and attribute causality” (ibid., p. 17).

The affective dimension is critically involved in transformative learning: “Our values and sense of self are anchored in our frames of reference. They provide us with a sense of stability, coherence, community, and identity. Consequently, they are often emotionally charged and strongly defended” (ibid., p. 18).

**AFFECTIVE DIMENSION**

The constructivist and social constructivist theories of learning just discussed recognize the crucial role of affect. The influence of affective factors in communication and learning has been explored in a great variety of ways and from significantly differing theoretical and methodological stances. Overviews of the role of the affective in communication and learning include a wide range of theories, constructs, and factors, such as self-efficacy, attitude, motivation, goals, expectations, drives, needs, attributions, values, belief, intentions, social cognition, self-regulation, volition, self esteem, and identity (see, for example, Littlejohn, 1999; Schunk, 2004). The last decades of research and scholarship in psychology, linguistics, anthropology, neurosciences, and artificial intelligence have begun to bring the mind back to its biological
roots by providing a more precise view of how and why the brain is the necessary but not sufficient condition for the development of the mind (e.g., see Bruner, 1990; Edelman, 1992). A key implication of this research on the mind is the importance of emotions in mental processes (Damasio, 1994, 1999, 2003; Edelman, 1992; LeDoux, 1998).

Rather than taking a particular stance with which to view the role of affect, the following discussion explores the challenges of integrating this aspect of thinking and learning into the structures and procedures of educational institutions and presents some attempts to recognize the role of affect in higher order thinking, namely the conduct of research. This section’s discussion ends with the suggestion that linking self-efficacy, dialogic inquiry, transformational learning, and intentional conceptual change theory provides a means to conceptualize cognition, affect, social interaction, and empowerment as integrated in a unified learning process.

**The Affective in Education**

Identifying discrete affective objectives for learning has been challenging. Because Bloom’s taxonomy of affective objectives is often the basis for affective education in schools, it is instructive to examine how the developers (Krathwohl et al.) viewed it.

In the early 1950s, after a successful delineation of educational objectives in the cognitive domain (Bloom et al., 1956), the national team of scholars on the educational taxonomy project went on to tackle the affective domain. As the editors noted in the preface to the affective taxonomy (Krathwohl et al., 1956: vii), “we found the affective domain much more difficult to structure, and we are much less satisfied with the result. Our hope is, however, that it will represent enough of an advance in the field to call attention to the problems of affective domain terminology.”

Briefly, they identified a decline of affective objectives in curricula from kindergarten through university levels as due to: (1) the growing view among educators that the affective domain relates to personal philosophy and opinions, which are private matters; (2) sensitivity to accusations of “indoctrination” among schools with affective objectives; (3) the difficulty of assessing the attainment of affective objectives; and (4) a greater emphasis on cognitive content that could be graded.
Their affective objectives taxonomy proceeds through five stages: Receiving, Responding, Valuing, Organization, and Characterization by a Value or a Value Complex. These are seen as falling along a continuum of increasing involvement, specification, and order.

The continuum progressed from a level at which the individual is merely aware of a phenomenon, to being able to perceive it. At a next level he is willing to attend to phenomena. At a next level he responds to the phenomena with a positive feeling. Eventually he may feel strongly enough to go out of his way to respond. At some point in the process he conceptualizes his behavior and feelings and organizes these conceptualizations into a structure. This structure grows in complexity as it becomes his life outlook. (italics in the original; ibid., p. 27)

A key feature of this process is called internalization, “a process by which a given phenomenon or value pass[es] from a level of bare awareness to a position of some power to guide or control the behavior of a person” (ibid., p. 27).

Thus in the Taxonomy internalization is viewed as a process through which there is at first an incomplete and tentative adoption of only the overt manifestations of the desired behavior and later a more complete adoption ... This definition suggests that the culture is perceived as the controlling force in the individual's actions. It is true that the internalization of the prevailing values of the culture describes the bulk of contemporary objectives. But it is equally true that our schools, in their roles as developers of individualism and as change agents in the culture, are not solely concerned with conformity. Internalization as defined in the Taxonomy provides equally for the development of both conformity and nonconformity, as either role pervades individual behavior. (ibid., p. 29)

In their discussion of the nature of the affective domain and its relationship to the cognitive, the authors note, “The fact that we attempt to analyze the affective area separately from the cognitive is not intended to suggest that there is a fundamental separation. There is none ... behavior may be conceptualized as being embedded in a cognitive-emotional-motivational matrix in which no true separation is possible” (ibid., p.45). They take the approach that cognitive objectives have an affective component and draw rough parallels between the cognitive and affective taxonomies (see Chart 1).
Chart 1. Relation of Cognitive and Affective Educational Objectives
(Krathwohl et al., 1956: 49-50)

<table>
<thead>
<tr>
<th>Level</th>
<th>Cognitive Objectives Continuum</th>
<th>Affective Objectives Continuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The cognitive continuum begins with the student’s recall and recognition of Knowledge (1.0).</td>
<td>The affective continuum begins with the student’s merely Receiving (1.0) stimuli and passively attending to it. It extends through his more actively attending to it.</td>
</tr>
<tr>
<td>2</td>
<td>It extends through his Comprehension (2.0) of the knowledge.</td>
<td>It extends to his Responding (2.0) to stimuli on request, willingly responding to these stimuli, and taking satisfaction in responding.</td>
</tr>
<tr>
<td>3</td>
<td>It further extends to his skill in Application (3.0) of the knowledge that he comprehends.</td>
<td>It further extends to his Valuing (3.0) the phenomenon or activity so that he voluntarily responds and seeks out ways to respond.</td>
</tr>
<tr>
<td>4</td>
<td>It further extends to his skill in Analysis (4.0) of situations involving this knowledge, his skill in Synthesis (5.0) of this knowledge into new organizations.</td>
<td>It further extends to his Conceptualization (4.1) of each value responded to.</td>
</tr>
<tr>
<td>5</td>
<td>It further extends to his skills in Evaluation (6.0) in that area of knowledge to judge the value of material and methods for given purposes.</td>
<td>It further extends to his Organization (4.2) of these values into systems and finally organizing the value complex into a single whole, a Characterization (5.0) of the individual.</td>
</tr>
</tbody>
</table>

The authors note that in Steps 4 and 5, where there is closest contact between the cognitive and the affective domains, “the behavior described by the affective domain is at least in part cognitive, as the student conceptualizes a value to which he has been responding, and this value is in turn integrated and organized into a system of values which comes eventually to characterize the individual” (ibid., p. 51). After an analysis of all the steps, they conclude that “it appears that at all levels of the affective domain, affective objectives have a cognitive component, and one can find affective components for cognitive objectives” (ibid., p. 53). They offer also this cautionary note: “Though undoubtedly there is some cognitive component in every affective objective, its nature is much more easily seen in some instances than in others” (ibid., p. 53). They give the example of art appreciation as having a more easily seen affective component.

On the subject of cognitive objectives as means to affective goals and affective objectives as means to cognitive goals, “In some instances it is impossible to tell whether the affective goal is being used as a
means to a cognitive goal or vice versa. It is a chicken and egg proposition. Perhaps it is fairest to say they are both being sought simultaneously” (ibid., p.59).

Presently, the American Psychological Association (1997) has articulated 14 learner-centered psychological principles it deems basic for school reform. The principles include motivational and affective principles, as well as cognitive and metacognitive, developmental and social, and individual difference factors influencing learners and learning. Together, these principles provide a holistic framework for considering the wide range of factors that influence constructivist learning.

**The Affective in the Research Process**

While many volumes have been written about the nature of the scientific research process and some studies have linked reasoning and emotion (e.g., Evans, D., 2002), there appears to be no widely accepted model of the research process as experienced by novice adult researchers that integrates the role of the affective dimension. The nearest equivalent consists of the studies done about high school students undertaking the information search and research process. One of the most widely used models is Carol Kuhlthau’s (1993; 1994) model of the information search process, one of the few that identifies specific affective responses at each of the stages of information seeking and research.

Kuhlthau’s model addresses cognitive, affective, and sensorimotor skills in seven stages that parallel the inquiry process: (1) **Initiation**: preparing for the decision of selecting a topic, (2) **Selection**: identifying the general area to be investigated, (3) **Exploration**: investigating information with the intent of finding a focus, (4) **Formulation**: taking a personal stand on the topic in response to the information encountered, (5) **Collection**: gathering information that defines, extends, and supports the focus, (6) **Presentation**: concluding the search for information and presenting the information, and (7) **Assessment**: evaluating the search process. In several research studies undertaken with high school students, including a longitudinal study of some of these students into their college years, Kuhlthau observed that students involved in the research process exhibited characteristic emotional patterns associated with stages in the process. She identified these patterns as grounded in a synthesis of the constructivist ideas of John Dewey, George Kelly, and Jerome Bruner. Kuhlthau’s integrated model of cognitive, affective, and sensorimotor activities is presented in Chart 2.
Chart 2. Kuhlthau’s Model of the Information Search Process  
(Synthesized from Kuhlthau, 1993, 1994)

<table>
<thead>
<tr>
<th>Stage 1: Initiation – Become aware of a lack of understanding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thoughts</strong></td>
</tr>
<tr>
<td>Vague thoughts about the general area of the problem</td>
</tr>
<tr>
<td>Relate the problem to personal experience</td>
</tr>
<tr>
<td>Consider areas to investigate</td>
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<table>
<thead>
<tr>
<th>Stage 2: Selection – Identify the general area to be investigated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thoughts</strong></td>
</tr>
<tr>
<td>Weigh prospective topic areas</td>
</tr>
<tr>
<td>Predict outcomes</td>
</tr>
<tr>
<td>Consider the topic area with best potential for success</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 3: Exploration - Investigate information to find a focus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thoughts</strong></td>
</tr>
<tr>
<td>Vague thoughts, hard to express what information is needed</td>
</tr>
<tr>
<td>Become informed</td>
</tr>
<tr>
<td>Identify several possible foci</td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Stage 4: Formulation - Formulate a focus from the information encountered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thoughts</strong></td>
</tr>
<tr>
<td>Thoughts become increasingly well defined as a more focused perspective is formed</td>
</tr>
<tr>
<td>Sometimes an “aha!” moment of discovery and creativity</td>
</tr>
<tr>
<td></td>
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<td></td>
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<table>
<thead>
<tr>
<th>Stage 5: Collection - Gather information that defines, extends, and supports the focus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thoughts</strong></td>
</tr>
<tr>
<td>Clearer sense of direction; can specify need for information</td>
</tr>
<tr>
<td>Realization of extensive work to be done</td>
</tr>
<tr>
<td>Organize</td>
</tr>
</tbody>
</table>
Chart 2. (Continued) Kuhlthau's Model of the Information Search Process

<table>
<thead>
<tr>
<th>Stage 6: Presentation - Conclude the search; present ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoughts</td>
</tr>
<tr>
<td>Personalized understanding of aspects of the focus</td>
</tr>
<tr>
<td>Identify any need for more information, notice less relevance, more redundancy</td>
</tr>
</tbody>
</table>

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<tr>
<th>Stage 7: Assessment - Evaluate the search process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoughts</td>
</tr>
<tr>
<td>Self-awareness</td>
</tr>
<tr>
<td>Identify problems &amp; processes</td>
</tr>
<tr>
<td>Plan future research strategy</td>
</tr>
</tbody>
</table>

Two things are significant about Kuhlthau's model. First, it is only in Stage 4, Formulation, that the student researcher finally articulates the focused topic that will guide his/her information search and decision about methodology. This points out how difficult topic selection really is. What is often missed in advice about selecting a topic is that the first crucial stages are time-consuming and challenging. Second, the process of narrowing and focusing the search topic utilizes cognitive and affective skills, i.e., topic selection is emotionally and intellectually challenging. Grappling with uncertainty and anxiety are part of the process of finding a focus for research, and anxiety can derail the research process especially in the early stages.

The three processes of inquiry-based learning, research as inquiry, and the information search process are essentially variations of a common inquiry learning process, with attendant affective dimensions at each stage. Chart 3 presents a comparison of these three processes. These processes are iterative, though the presentation is linear to capture the main activities.
<table>
<thead>
<tr>
<th>Inquiry-Based Learning*</th>
<th>Research as Inquiry</th>
<th>Information Search Process (Kuhlthau)</th>
</tr>
</thead>
</table>
| **Ask**: Ask an authentic, meaningful question; Pose a problem. | **Wonder**: Be drawn to an issue, concept, or subject growing from questions, dilemmas, passions, injustices. Be self-aware. | **Stage 1: Initiation**: Become aware of a lack of understanding.  
**Stage 2: Selection**: Identify the general area to be investigated. |
| **Connect**: Connect to self, previous knowledge; Gain background knowledge to set context for new learning; Observe, experience. | **Explore**: Relate the issue to self-knowledge, worldviews, disciplines, research methods, previous research, experiences of other practitioners. | **Stage 3: Exploration**: Investigate information to find a focus. |
| **Wonder**: Develop questions. Make predictions, hypotheses. | **Focus**: Identify a “burning” issue or question, and appropriate research methodology. Predict findings. | **Stage 4: Formulation**: Formulate a focus (hypothesis) from the information. |
| **Investigate**: Find and evaluate information to answer questions. Think about the information to illuminate new questions and hypotheses | **Investigate**: Be mentally questioning, emotionally tuned for both engagement and detachment, ethically sensitive. Collect data. Use and refine tools and strategies. Grapple with obstacles and dead-ends. **Analyze**: Use and create conceptual tools and strategies to order, categorize, analyze, synthesize, and hypothesize. Investigation and analysis are intertwined. Be aware of processes, patterns, and relationships. Expect to change own way of seeing. | **Stage 5: Collection**: Define, extend, and support the focus; interpret information (compare, contrast, analyze, integrate, synthesize, organize, infer, paraphrase, classify, etc.) |
| **Express**: Express new ideas to share learning with others. Apply understandings to a new context, new situation | **Conclude/Share**: Continually share ideas, learn from others. Understand the issue in a new way - answers to the question, insights from process, new methods, or better practices. Identify audience for report. Organize report; frame findings with connections to context and literature; describe data and methods; describe process and results of analysis; evaluate strengths, weaknesses, and contributions; summarize; and recommend further research. | **Stage 6: Presentation**: Conclude the search; interpret information (see above); present ideas (compose, write, design, draft, edit, revise, express through written or multimedia forms). |
| **Reflect**: Reflect on own process of learning and on new understandings gained from inquiry. Ask new questions. | **Reflect**: Connect with past experiences and previous data. Reflect on mental, emotional, and ethical responses. Question ideas and assumptions and seek alternatives. Seek appropriate distance and detachment. Be sensitive to emerging concepts and hypotheses. Probe and realign values. | **Stage 7: Assessment**: Evaluate the search/research process. |

Diane Nahl, another scholar in the field of library and information science, has drawn attention to the affective as the first and most basic dimension in the information seeking process. Based on studies of information seeking behavior (e.g., Jakobovits and Nahl-Jakobovits, 1987, 1990; Nahl, 1997), she states that, “Without the affective support, cognitive skills are not acquired” (Jakobovits and Nahl-Jakobovits, 1990: 451). Her Affective, Cognitive, and Sensorimotor (ACS) Taxonomy of information behavior views the process of information seeking as holistic. In each dimension – affective, cognitive, sensorimotor – three stages of increasing depth occur: Level 1, orientation; Level 2, interaction; and Level 3, internalization (Jakobovits and Nahl-Jakobovits, 1987; Nahl, 1997). At Level 1, users attempt to orient themselves and adapt to information situations cognitively (e.g., identify some element in the environment), affectively (e.g., express frustration or a sense of accomplishment), and through sensorimotor activity (e.g., achieve mastery of a new skill). At Level 2, users achieve some form of self-directed ACS interaction with the information environment. At Level 3, users personalize or internalize information activities, becoming knowledgeable, committed, and highly skillful.

With respect to the affective domain, Nahl presents an information counseling taxonomy of solutions to users’ affective information needs that addresses three levels of affective functions: (1) orienting and adjusting to overcome resistance to information seeking; (2) advising and coaching to strengthen information intentionality; and (3) reassuring and consoling to encourage acceptance and support. She provides specific examples of advice that counselor’s can give to information seekers.

A related aspect of information seeking is the social or interactional dimension. In her review of the research on the interactional dimension in the school library context, Nancy Pickering Thomas (1999:153) characterizes library encounters as “communicative action” and concludes from a review of the research that “information seeking is affective and social as well as cognitive and informational, and the relational aspects of a library encounter may be as or more important than the informational aspects.”

Kuhlthau, Nahl, and Thomas show clearly that the research process that has evolved in library environments recognizes the important role of affect and evinces the essential characteristics of inquiry
learning, constructivism in education, the social nature of learning, and the critical role of dialogue in knowledge building.

This selective review of constructivist views of the affective from scholars in education and library and information science leads to a holistic view of the role of the affective in communication and learning. There are several implications of this approach for the conduct of this study. First, it provides the basis for assuming that the affective is always present in learning activities. Second, because emotions are complexly integrated with cognition (and all other aspects of mental life), it suggests that the affective cannot be structured in the same way as the cognitive and may often be visible as a dimension of individual action or social interaction. Third, it signals the difficulty of identifying the affective aspects in written, online communication dealing with predominantly cognitive activities, because of the lack of nonverbal and paralinguistic cues that often signal emotional states. These three preliminary conclusions suggest that the emotional content of online communication should be sought on multiple levels— in single utterances and in sequences of utterances that comprise progressively larger units that have coherence. It also suggests that participant self-reports may be the most direct way of identifying the role of the affective for participants.

**Self-Efficacy and Intentional Conceptual Change**

Within the realm of the affective dimension, the concept of self-efficacy is important for the identification of factors that enable individual and group empowerment. Self-efficacy is belief in one’s capabilities to produce desired effects by one’s actions (Bandura, 1997: vii). In inquiry learning and transformative learning, where authentic questions and personal interest drive the learning process, self-efficacy is one of the most important tools that individuals have to enable them to be more powerful and efficient learners and social actors. Bandura (ibid., p. 3) notes the diverse and pervasive influence of self-efficacy in human learning and functioning:

> People's beliefs in their efficacy have diverse effects. Such beliefs influence the courses of action people choose to pursue, how much effort they put forth in given endeavors, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishments they realize. (op cit.)
Self-efficacy is one component in Bandura's social cognitive theory, along with personal aspirations, outcome expectations, and perceived opportunity structures and constraints, among others (1986, 1997). In this theory, human agency operates in reciprocal relationships with three factors encompassing self and society: (1) internal personal factors in the form of cognitive, affective and biological events; (2) behavior; and (3) environmental events (ibid., p. 4-5). Individual thoughts, feelings, and actions are influenced by the environment and in turn change the environment. From the perspective of this theory, Bandura describes the key role that self-efficacy plays in learning and skills acquisition:

Social cognitive theory encompasses a large set of factors that operate as regulators and motivators of established cognitive, social, and behavioral skills ... Perceived self-efficacy occupies a pivotal role in social cognitive theory because it acts upon the other classes of determinants. By influencing the choice of activities and the motivational level, beliefs of personal efficacy can make an important contribution to the acquisition of the knowledge structures on which skills are founded. (ibid., p. 34-35)

The effective exercise of control involves applying one's knowledge, skills, and the available resources to problem solving and management. Emotional skills play a critical role:

Means encompass not only cognitive and behavioral skills but also emotional and motivational self-regulative skills for enlisting motivation and managing disruptive emotional arousal. Moreover, the results people produce depend on how well they use available means as well as the potential utility of those means. The implementive aspect is an integral part of agency. Hence, people with the same means may perform adeptly or poorly under taxing circumstances because their efficacy beliefs affect how well they use the means at their disposal. (ibid., p. 27)

Self-efficacy is not an “omnibus trait” but a “differentiated set of self-beliefs linked to distinct realms of functioning” (ibid., p. 36). One may have high self-efficacy in dance but low self-efficacy in computer programming, for example. The chief sources of self-efficacy are enactive mastery experience, vicarious experience, verbal persuasion, and physiological and affective states. In addition, individuals integrate efficacy information from these various sources, with varying degrees of accuracy or bias.

Once efficacy beliefs are formed, they influence and regulate human functioning through four mediating processes: cognitive, motivational, affective, and selection processes. These processes generally operate together rather than in isolation. A high sense of efficacy often leads to setting challenging goals through analysis of conditions, opportunities, and self-capacity. Challenging goals then “raise the level of motivation and performance attainments” (ibid., p. 116).
Motivation based on goals is influenced by three personal factors: “affective self-evaluative reactions to one’s performance, perceived self-efficacy for goal attainment, and adjustment of personal standards in light of one’s attainments” (ibid., p. 128). The strength of motivation is related to goal specificity, goal challenge, and goal proximity (ibid., p. 133-135). Self-efficacy also affects the nature and intensity of emotional experience and plays a key role in the regulation of affective states. This is done through the exercise of personal control over thought, action, and emotion:

The thought-oriented mode in the regulation of affective states takes two forms. Efficacy beliefs create attentional biases and influence whether life events are construed, cognitively represented, and retrieved in ways that are benign or emotionally perturbing. The second form of influence centers on perceived cognitive abilities to control perturbing trains of thoughts when they intrude on the flow of consciousness. In the action-oriented mode of influence, efficacy beliefs regulate emotional states by supporting effective courses of action to transform the environment in ways that alter its emotive potential. The affect-oriented mode of influence involves perceived efficacy to ameliorate aversive emotional states once they are aroused. (ibid., p. 137)

Selection processes refer to the choice of types of activities and environments. Those with high efficacy tend to choose difficult activities and stay with them longer. This affects career options and choice of work environment.

Closely related to Bandura’s work on self-efficacy, as well as Wells’ work on dialogic inquiry and Mezirow’s work on transformational learning theory, is recent work on intentional conceptual change (e.g., Sinatra and Pintrich, 2003b). In contrast to some constructivist views that place primary responsibility on teachers and instructional designers to create stimulating learning environments, researchers of conceptual change have proposed that learners can play a far greater role in the construction of knowledge through their intentions (Bereiter and Scardamalia, 1989; Sinatra and Pintrich, 2003b). Intentional conceptual change is “the goal-directed and conscious initiation and regulation of cognitive, metacognitive, and motivational processes to bring about a change in knowledge” (Sinatra and Pintrich, 2003a: 6). In this process, the learners take control not only of the goal of learning but also of the process of monitoring and regulating their learning.

Metacognition refers to an awareness of one’s ideas, the learning process, and one’s state of knowledge, and to the ability to utilize these to organize problem solving (Hennessey, 2003: 107). It requires “taking an authentic ‘meta’ stance toward one’s own conscious experiences ... explicitly
interpreting and mastering one’s intentions in light of deeply held beliefs and values” (Ferrari and Elik, 2003: 43). This is reflection of a high order:

The more actively and deeply one seeks to comprehend ... the more likely one will see inconsistencies that a more superficial processing would fail to discover ... Metacognitive experiences are provoked as a result of active reflection. Active reflection maximizes articulate interpretation by making critical predictions about the expected results of one’s efforts. There is an obvious parallel between the notion of provoked metacognitive experience and the notions of self-diagnosis and perceived self-efficacy in the social learning model of self-regulation. (op cit.)

Having the skills to engage in metacognitive activities does not mean that one will use them. Motivation to use them is also crucial (Hennessey, 2003: 107).

Learning through conceptual change “is an interaction between new and existing conceptions, with the outcome being dependent on the nature of the interaction” (ibid., p.108). If the learner is dissatisfied with her own conceptions and finds a new idea understandable, plausible, and useful, conceptual change is likely to occur. This can mean the extinction of an idea, the addition of new knowledge, or the replacement of one idea with another (ibid., p.109-110). Intentional conceptual change at its deepest level “involves a person’s (or group’s) deliberate attempt at radical change from one conceptual system to another because they are captivated by the power of that new conceptual system ... or because they perceive some deep flaw in their current view” (Ferrari and Elik, 2003: 36).

Intentional conceptual change is not only or even predominantly a cognitive process (Sinatra and Pintrich, 2003a). Beliefs, motivation, and social factors play an important role. Motivation is defined as the instigation and pursuit of goal-directed activity (Pintrich and Sinatra, 2003a: 431). Various motivational factors such as interest, attitude, utility, and importance have been shown to influence intentional conceptual change (Andre and Windschitl, 2003; Southerland and Sinatra, 2003).

Though much research remains to be done in developing a model for intentional conceptual change, Pintrich and Sinatra (2003a: 439-440) offer principles for designing instructional interventions to study and encourage intentional conceptual change. First, “instruction should attempt to foster a goal of conceptual understanding or mastery in students ... including fostering interest in course content, aiding students’ development of epistemological awareness and sophistication, and focusing classroom discourse on understanding.” Second, “instruction should attempt to make students aware of the gaps or problems in their conceptual understanding.” Third, “instruction should offer or teach students different strategies for
regulating and controlling their own cognition in order to foster deeper conceptual understanding.”

Examples of these strategies are self-explanation, self-questioning, and setting aside emotional commitments to beliefs that hinder understanding in order to be open to alternative views. These principles are clearly related to transformative learning theory and the goals of fostering self-efficacy and self-empowerment.

Self-efficacy and the related idea of intentional conceptual change play an important role in online learning and telementoring under the conditions of this research project. Students have a large measure of control over their own learning. They select, plan, conduct, and evaluate their own research projects. Learning facilitators and mentors are challenged to foster the development of self-efficacy through supporting realistic aspirations, encouraging the cultivation of intrinsic interest, scaffolding the use of cognitive and metacognitive skills, providing performance feedback on perceived self-efficacy, and suggesting strategies for self-regulation to foster deeper conceptual understanding.

SOCIAL DIMENSION

The importance of social interaction in collaborative learning has been discussed particularly related to dialogic inquiry and transformational learning. This section discusses two functions of such interactions: (1) the co-construction of knowledge and meaning by participants and (2) social interaction that leads to relationship building.

Co-Construction of Knowledge and Meaning

While definitions of the co-construction of knowledge vary, this usually involves the contribution of individual ideas to shared knowledge or problem solving. Wells prefers to call this the “co-construction of meaning” to emphasize the importance of knowledge building as a meaning-making activity.

One of the theories used in much of the work about the co-construction of knowledge in computer supported collaborative learning is Herbert Clark’s theory of common ground (Clark and Brennan, 1991). In this theory, language is viewed as a collaborative activity of establishing common ground in communication as the basis for developing further common ground and thus communicating efficiently.
(Monk, 2003). (The uses and costs of different communication media in establishing common ground are discussed in more detail below in the section, “Online Communication Literacy.”)

While the appropriateness of Clark’s theory is currently being debated among CSCL theorists, it contributes useful concepts for the consideration of constraints and resources used by communicators to co-construct knowledge and meaning online. Other theoretical contributions to the concept of co-construction of knowledge are activity theory (Leont’ev, 1978), situated learning (Lave and Wenger, 1991), and distributed cognition (Flor and Hutchins, 1991). According to Nardi (2001), these complementary theories have different emphases. Activity theory has as its unit of analysis an activity that is comprised of subject (person engaged in the activity), object (objective or goal), actions (goal-directed processes), and operations (the way an activity is carried out). Situated learning has as its unit of analysis “the activity of persons-acting in a setting,” i.e., the relationship between individuals and environment within an activity. In contrast to activity theory, the goal orientation of individuals is not considered. The unit of analysis in distributed cognition is a larger cognitive system composed of individuals and artifacts, with an emphasis on cognitive structures, representations, and the interrelationships between individuals and artifacts.

Recently, scholars in the field of computer supported collaborative learning have suggested that focus should be now be placed on small groups as the engine that connects individually constructed learning with knowledge constructed at the system level. Gerry Stahl (forthcoming) has proposed the concept of group mediated learning and described how knowledge co-constructed by a small group is distinct from individually constructed knowledge and from knowledge at the level of a community of practice. He suggests that this concept provides the missing link in the chain of knowledge construction from individual to community and society, and that studying the co-construction of knowledge at the small group level best illuminates the process of social construction of knowledge. Suthers (forthcoming) adds the complementary idea that intersubjective learning is the primary mechanism of small group cognition.

Taken together, these theories contribute important dimensions to the concept of co-construction of knowledge: meaning-making, motivation, goal orientation, the importance of context, artifacts as the embodiment of socially constructed knowledge, the relationship between individuals and artifacts, small
group mediated learning, and the larger system of cognitive structures and representations that
encompasses individuals, groups, and artifacts.

**Relationship Building**

A second aspect of the social dimension is relationship building. The importance of building trusting
relationships has already been discussed with regard to constructivist learning theories and the affective
dimension of learning. The majority of literature on building caring student-teacher relationships in
education appears to be focused on the K-12 classroom (e.g., Barber, 2002; Mendes, 2003; Monzo and
Rueda, 2001; Muller, 2001; Wentzel, 1997). Issues raised in the literature related to K-12 classrooms
include: (1) cultural relevance related to supporting minority children; (2) building trust and respect; (3) the
influence of teacher-student interaction and rapport on motivation and achievement; and (4) self-disclosure
and privacy.

A substantial body of literature exists on mentoring of youth. The National Mentoring Partnership defines mentors as follows: “A mentor is an adult who, along with parents, provides young people with support, counsel, friendship, reinforcement and a constructive example. Mentors are good listeners, people who care, people who want to help young people bring out strengths that are already there.” They state that successful mentors: (1) have a sincere desire to be involved with a young person; (2) respect young people; (3) actively listen; (4) empathize; (5) see solutions and opportunities; and (6) are flexible and open. The National Mentoring Center identifies five major face-to-face mentoring program styles: school-based, faith-based, community-based, career/vocational, peer mentoring, and the newest genre, telementoring (or e-mentoring).

Though less voluminous than the literature at K-12 levels, studies on higher education are also attending to the importance of relationship building, particularly in nursing. Creating “caring” college classrooms (e.g., Tebben, 1995), relationship building in pre-service teacher training (e.g., Lindsey, 2000), and distance education (e.g., Rovai, Cristol, and Lucking, 2001) are receiving attention. In distance education, creating a “caring classroom” is often described as creating a community of practice (Wenger, 2000).

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3 http://www.mentoring.org/
4 http://www.nwrel.org/mentoring
1998), an online community (e.g., Preece, 2000), or a community of learners (e.g., Paloff and Pratt, 1999). Paloff and Pratt focus on the fundamental importance of community building in the online classroom based on their extensive experience with distance education for adults. They highlight six keys to success in distance learning: (1) honesty, (2) responsiveness, (3) relevance, (4) respect, (5) openness, and (6) empowerment.

Mentoring is also viewed as a key component in teacher education and teacher retention. The National Commission on Teaching and America’s Future (NCTAF) recommends three strategies to “provide every child in America with competent, caring, qualified teachers in schools”: (1) create strong learning communities; (2) assure quality teacher preparation; and (3) support professionally rewarding teaching careers. Mentoring of new teachers by site mentors is a critical component of new teacher induction programs that improve teacher retention. The Alliance for Excellent Education’s (AEE) report, Tapping the Potential: Retaining and Developing High Quality New Teachers, places high-quality mentoring within a comprehensive induction program that also includes common planning time, ongoing professional development, participation in an external network of teachers (community of practice), and standards-based evaluation.

AEE (2004: 16) reports that quality professional development is “a sustained, intensive effort to improve teaching and learning ... [that is] collaborative, long term and content driven. It requires teachers to be active learners, not passive recipients.” Participating in communities of practice that can involve coaching and mentoring supports quality professional development: “By networking with their peers, beginning teachers reflect on their work, receive personal support from colleagues, and learn from the successes and failures of other beginners. Reflection is critical because new teachers are developing a public identity – what it means to be a teacher in their school and in the wider profession. Networks form beginners into members of the teaching profession” (AEE, 2004: 29).

Student teacher mentoring has received considerable attention and takes a variety of forms. Tomlinson (1995: 20) presents a program of comprehensive mentoring strategies for “active assistance for student teacher learning.” The basic functions of mentoring are to actively assist student teachers with:

- Acquisition of awareness and strategies relevant to teaching;
- Engagement in teaching activity which deploys such strategies and awareness;
• Monitoring of these teaching activities and their effects;
• Adapting strategy and awareness in the light of reflection on such feedback.
• In all this, the mentor will need to act and communicate so as to motivate the student teacher and harness their personal strengths through appropriate interpersonal strategies and awareness.

Awareness, reflection, and interpersonal strategies are key aspects of this form of mentoring. The role the mentor takes is that of reflective coach and effective facilitator of the interpersonal aspects of mentoring. Tomlinson emphasizes that students and mentors contribute knowledge, values, goals, and feelings to the mentoring relationship. The core counseling conditions he identifies are acceptance or unconditional positive regard, accurate empathy (the ability to gain and communicate that one is gaining a sense of how things appear and feel to the other person), and genuineness or authenticity (Tomlinson, 1995: 83-84).

**ACTION RESEARCH FOR PROFESSIONAL DEVELOPMENT**

Reflective practice and action research are closely related in discussions of professional development and are sometimes used interchangeably to refer to a systematic, critical thinking process aimed at improving one’s own practice as an educator.

**Reflective Practice**

In *Democracy and Education*, Dewey (1916: 163) argues for the central role of thinking in education and describes thinking as a process of inquiry learning that is identical in essence to methods of reflection:

Processes of instruction are unified in the degree in which they center in the production of good habits of thinking. While we may speak, without error, of the method of thought, the important thing is that thinking is the method of an educative experience. The essentials of method are therefore identical with the essentials of reflection. They are first that the pupil have a genuine situation of experience — that there is continuous activity in which he is interested for its own sake; secondly, that a genuine problem develop within this situation as a stimulus to thought; third, that he possess the information and make the observations needed to deal with it; fourth, that suggested solutions occur to him which shall be responsible for developing in an orderly way; fifth, that he have opportunity and occasion to test his ideas by application, to make their meaning clear and to discover himself their validity.

Nearly 70 years after these progressive ideas were presented, Donald Schon’s book *Reflective Practice*, published in 1983, spawned excited reaction in the education community. Virginia Richardson (1990: 3) notes, “Just three years later, the 1986 American Educational Research Association conference program could have been called the ‘Reflective Teacher Program’; and one can hardly read an article about teaching without mention of reflection.” The avid interest has continued and led to a cornucopia of
resources and research on reflective practice. A recent search (November 12, 2004) on the UMI ProQuest Digital Dissertations database produced 324 theses related to reflective practice in the field of education.

It is widely recognized that teacher quality is the key to improving student learning. The Professional Development School Standards of the National Council for the Accreditation of Teacher Education (NCATE) are aimed at improving teacher education to produce quality teachers. These standards address the integration of professional and student learning through inquiry, placing students with their diverse learning needs at the center of professional development work, learning in the context of practice, and leveraging change, among others. Reflection was an important part of the process of developing the standards, as well as an integral part of the “process of continuous assessment, reflection, and action” embedded in the standards themselves (NCATE, 2001).

Levin (2003) conducted a rare 15-year longitudinal study of four student teachers as they matured into professionals. She found that three major factors influenced the development of their pedagogical understandings over their careers: (1) ongoing support in order to continue to develop and to remain in the classroom; (2) opportunities that encourage and allow them to continue to be learners; and (3) reflective and metacognitive thinking about teaching, learning, behavior, and development.

There are many dimensions and definitions of reflective practice. Among the most important contributions have been those of Dewey, Van Manen, Schon, and Boud et al. Dewey (1910) described reflection as a rational, scientific thinking process for grappling with puzzling real-life situations, finding valid solutions, making meaning, and establishing beliefs. The central goal of education for Dewey is the development of thinking and reflection toward the living of a responsible social and civic life. Max Van Manen (1977) suggested three levels of reflectivity that are widely used to distinguish among types of reflectivity. Technical reflection focuses on examining skills, strategies, and methods used to reach predetermined goals. Practical reflection focuses on the methods to reach goals and also on examining the goals themselves. Critical reflection questions the broader moral, ethical, and social assumptions underlying the goals, often with a call for change or reform. Schon (1983) distinguished between reflection-in-action and reflection-on-action, the former referring to observing thinking and action as they are
occurring and the latter referring to such observation after an experience in order to effect changes in future practice.

David Boud et al. (1985a) provide a model of reflection in learning that is among the few that integrates the affective dimension. They define reflection as the “intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations” (ibid., p.19). Reflection is controlled by the learner, purposeful, and involves affect and cognition in an interrelated and interactive way (Boud et al., 1985b: 11). Negative feelings can provide barriers to learning, while positive feelings can greatly enhance learning. External validation is often needed to promote self-esteem. The three stages of the model are: (1) returning to experience – observations of behavior, feelings, and ideas that occurred at the time; (2) attending to feelings – utilizing positive feelings or removing obstructing feelings; and (3) re-evaluating experience – making new associations, integrating thoughts and feelings, validation of new perceptions, and appropriation into the reflector’s value system. Facilitators can greatly assist the process of reflection.

Reflective practice is seen as valuable not only for development and improved practice at the individual teacher level but also for school and district improvement and educational reform. The North Central Regional Education Laboratory reviewed ten comprehensive school reform (CSR) models to guide schools seeking CSR funding from the U.S. Department of Education. In its report, NCREL notes that, “while all of the models encourage reflective practice to some extent, three of the models emphasize involving teachers as action researchers” (NCREL, 2000: 15).

Osterman and Kottkamp (1993: vii) argue that top-down reform fails to create change because change begins with individuals. They believe that reflective practice has the greatest potential to create educational improvement because it is “situation specific and places the professional in the very center of the attempt to create improvement.” Their reflective practice model posits that change comes via self-awareness and that it is rational, emotional, social, and cultural. The process of reflective practice is dialectic, experimental, collaborative, holistic, and personal, involving the learner as agent and the practitioner as action researcher. The reflective practice process involves the articulation of core beliefs and values, communication, and self- and organizational empowerment. This empowerment “emanates from the self” and is “grounded in
self-esteem, competence, and autonomy” (ibid., p. 186-187). The “reflective administrator” plays an important role.

Jennifer York-Barr et al. (2001) describe a “reflective practice spiral” that begins with individual reflection and then extends to reflection with partners, reflection in small groups and teams, school-wide reflective practice, and beyond to broader social groups and systems. They define reflective practice as “an inquiry approach to teaching that involves a personal commitment to continuous learning and improvement (ibid., p. 3). A reflective educator is one who “is committed to continuous improvement in practice; assumes responsibility for his or her own learning; demonstrates awareness of self, others, and the surrounding context; develops the thinking skills for effective inquiry; and takes action that aligns with new understandings” (ibid., p. 10). They identify two important personal capacities that promote reflection: promoting trusting relationships and expanding thought and inquiry. The learning principles that promote reflective practice are those that also promote inquiry learning, discussed above.

According to York-Barr et al. (ibid., p. 13-16), the benefits of the reflective practice spiral are many, including improvements in educational practice, increased student learning, increased personal capacities for learning and improvement, renewed clarity of professional purpose and a sense of empowerment, professional and social support and decreased isolation of teachers, greater knowledge of and commitment to the school, enhanced provision of learning resources, more coherent educational interventions, improved school climate, and increased personal and school-wide efficacy for meaningful and sustained improvements.

**Action Research**

Scientific or scholarly research is a rigorous, sophisticated inquiry learning process in which mature minds, like younger students, also “follow their sense of wonder into new discoveries and insights about the way the world works” (Stripling, 2003: 4). Researchers ask a question relentlessly, investigate its possible answers intelligently and creatively, and interpret the information in a way that contributes to the advancement of knowledge, understanding, and practice. They have developed an array of worldviews, disciplinary knowledge, methodologies, and practices that are the resources for research as inquiry.
Education is one of the most difficult areas in which to do research because its major decisions are driven more by contingency than theory. David Labaree (2003: 14) notes:

If we think of knowledge as ranging from hard to soft and from pure to applied, educational knowledge is both very soft and very applied. This knowledge is thoroughly soft because it is an effort to make sense of the collective consequences of the actions of large numbers of willful individuals who are making decisions about teaching and learning within a complex and overlapping array of social systems in response to multiple and conflicting purposes. Under such circumstances of great complexity, vast scale, uncertain purpose, and open choice, researchers are unlikely to establish valid and reliable causal claims that can be extended beyond the particulars of time, place, and person. … It is also thoroughly applied because it arises in response to the needs defined by an institutional arena rather than emerging from a particular theoretical domain.

These difficulties are the reason for the widespread use of qualitative methodologies in educational research. Qualitative methods are aimed at seeking understanding of phenomena that are complex and highly contingent.

Among qualitative approaches, action research is less theoretical and more practical — “Action research aims at feeding the practical judgement of actors in problematic situations. The validity of the concepts, models, and results it generates depends not so much on scientific tests of truth as on their utility in helping practitioners to act more effectively, skillfully and intelligently. Theories … are validated through practice” (McKernan, 1996: 4).

Types of action research range from theory-based research designs characterized by academic rigor, to highly reflective practice (Mitchell, 2003). Though there can be distinguishing differences, the term “action research” is often used interchangeably with practitioner research, teacher research, and reflective practice. Action research as reflective practice had its seeds in the late 1960s and early 1970s with the Humanities Curriculum Project (HCP) in the UK under the leadership of Lawrence Stenhouse. Rather than collaborative teams of teachers who practiced and researchers who observed and reflected, the HCP emphasized the teacher as both practitioner and reflector (Elliott and Adelman, 1996). The Ford Teaching Project directed by John Elliott and Clem Adelman was also influential. Donald Schon’s 1980s’ work on reflective practice followed.

The roots of contemporary action research are usually seen in Kurt Lewin's work in the 1940s. Lewin was a social psychologist in the behavioral research tradition who studied group dynamics. His contribution was an elaborated theory that focused action research on a social problem needing resolution, with the goal
being better action or practice. He applied theories to practice through repeated cycles of problem
conceptualization, planning, fact-finding, implementation, and evaluation, leading into reconceptualization
for a further iteration of the process. Group participation was essential in this process. For Lewin and those
of like mind, the methods and tools used are common to quantitative social science research: interviews,
surveys, checklists, rating scales, sampling procedures, and interpretation of the data by professional
researchers. His approach was primarily an empirical, rational, positivist one. In the field of education,
Hilda Taba was a near contemporary of Lewin who applied his approach to curriculum development. James
McKernan (1996: 16) calls this the "scientific-technical view of problem-solving" (corresponding with Van
Manen’s technical reflection).

A second approach to action research combines quantitative methods with qualitative ones, such as
thick description, interpretation, dialogue, negotiation of meaning, and self-reflection. McKernan (1996:
20) calls this "practical-deliberative action research" (corresponding with Van Manen’s practical
reflection). It relinquishes some of the measurement and control of the scientific-technical view in order to
gain the benefits of deeper understanding of the points of view of the participants. There is a greater focus
on process and joint meaning making (hermeneutics) than products in this approach. Self-reflection is
highly valued. Prominent action researchers of this type are Lawrence Stenhouse and John Elliott. Elliott
and Clem Adelman directed the Ford Teaching Project, a landmark in educational action research that
examined how a small group of teachers developed pedagogy for and implemented inquiry learning. Elliott
and Adelman also established the Classroom Action Research Network (CARN), a major source of synergy
and support for action researchers in education.

A third approach is "critical-emancipatory educational action research" (corresponding with Van
Manen’s critical reflection; McKernan, 1996: 24). This approach rejects positivism and emphasizes that the
goal of practitioners' reflection is not only to improve practice but also to overcome constraints on practice
that emanate from limiting conditions and beliefs in the broader society. Two important dimensions are the
democratization of the research process and the political empowerment of participants, who are viewed as
change agents. While the sequential process of conducting action research is essentially the same as
Lewin's, the methods focus on discourse, self-reflection, and action based on values (often seen as moral imperatives). Proponents of this approach often draw on the ideas of Jurgen Habermas and Paulo Freire.

In his work with curriculum action research, McKernan (1996: 27-34) combines aspects of all three approaches into a time-process model that addresses the technical, practical, and critical elements of curriculum development (see Figure 1 and Chart 4). The steps in the action research cycle include identifying a problem situation, defining the problem, assessing needs, creating hypotheses as the basis for action, developing an action plan, implementing the plan, evaluating the action, and reflection to explain and understand the action in order to make a decision on whether a further action cycle is needed.

**Figure 1. McKernan's Time-Process Model of Action Research**

(McKernan, 1996: 29)

Curriculum goals and means are negotiated among a broad range of participants and stakeholders. Curriculum development requires technical skills (such as how to design instructional objectives) and practical skills (such as self-reflective monitoring and working with others). It also requires critical reflection by change agents who achieve their goals, in part, by exercising their research skills. McKernan (1996: 30) states the basics of his model:

The essential features of the model are its scientific-rational method of problem solving and its democratic, or collegial, ownership by the self-critical community of researchers. The focus is on
improving curriculum through moral problem solving using practitioners as research and development workers. The relationship between action and theory is acutely dialectical in that action cannot be set apart from the entity it explains. This practical perspective take precedence over theoretical model-building and research report writing since it is concerned with an answer to the question, "What ought to be done?" It is therefore highly normative in thrust: a moral and intensely practical pursuit.

McKernan distills features from other models into 16 features that are eclectic and synthesizing, with the “unifying theme” being “that all action research is a form of reflective inquiry governed by rigorous principles, or canons of procedure” (ibid., p.31).

**Chart 4. Features of McKernan’s Time-Process Model of Action Research**
(McKernan, 1996: 32-33)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>1 Increase human understanding</td>
<td>As a form of hermeneutical, or critical, inquiry, action research focuses upon understanding one’s own and others’ understanding of curriculum problems. Reflective thinking and reflexivity are the key notions here … interpretive understanding is the most central act of being human, and that by engaging in such acts we enhance our humanness.</td>
</tr>
<tr>
<td>2 Concern to improve quality of human action and practice</td>
<td>Action research seeks to make human performance more intelligent and effective, skillfully and reflectively.</td>
</tr>
<tr>
<td>3 Focus is on problems of immediate concern to practitioners</td>
<td>Problems are defined by those experiencing them, since practitioners are best placed to identify, analyze and inquire into those problems.</td>
</tr>
<tr>
<td>4 Collaborative</td>
<td>All those with a stake in the problem have a right to be included in the search for a solution. This also implies a shared “community of discourse” between insiders and outsiders; and that practitioners are not merely treated as “clients” but as co-investigators.</td>
</tr>
<tr>
<td>5 Conducted in-situ</td>
<td>Research is undertaken in the setting where the problem is encountered.</td>
</tr>
<tr>
<td>6 Participatory nature</td>
<td>Those affected participate in the research and implementation of preferred solutions. There is a demand that participants share their understanding of events and actions so that they appreciate the social construction of their practice.</td>
</tr>
<tr>
<td>7 Focus on the case or single unit</td>
<td>Action research examines a single case and not a sample population. Whole populations are studied: the classroom or school. Generalizations are problematic, though not impossible (Stenhouse, 1981) and case study methodology is a preferred form of research.</td>
</tr>
<tr>
<td>8 No attempt to control setting variables</td>
<td>Key variables are not isolated and manipulated as in experimental research. To place controls on subjects and parameters is to interfere artificially with a naturalistic setting.</td>
</tr>
<tr>
<td>9 The problem, aims and methodology may shift as inquiry proceeds</td>
<td>Action research does not consider problems to be “fixed.” As research proceeds the problem may be seen in a new light and a new definition of the situation may be required.</td>
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Chart 4. (Continued) Features of McKernan’s Time-Process Model of Action Research

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<td>10</td>
<td>Evaluative-reflective</td>
</tr>
<tr>
<td>11</td>
<td>Methodologically eclectic-innovative</td>
</tr>
<tr>
<td>12</td>
<td>Scientific</td>
</tr>
<tr>
<td>13</td>
<td>Shareability and utility</td>
</tr>
<tr>
<td>14</td>
<td>Dialogue/ discourse-based nature</td>
</tr>
<tr>
<td>15</td>
<td>Critical</td>
</tr>
<tr>
<td>16</td>
<td>Emancipatory</td>
</tr>
</tbody>
</table>

Action research combines characteristics of the research process with the skills of project planning and implementation. Its singular trait, however, is critical reflection. According to Ian Mitchell (2003: 199), teacher research is inextricably linked with practice and professional development: “These strong and unavoidable links between research, practice and professional development imply important differences between research carried out by teachers and much research carried out by university-based researchers.” The products of teacher research include not only a report of findings but improved abilities through professional development.

Action research can also foster the development of communities of practice locally and beyond. CARN (Collaborative Action Research Network), hosted by the Institute of Education at Manchester Metropolitan University, UK, was formed to continue the work of the Ford Teaching Project. It is active, sponsors conferences and publications, and has a strong internet presence. Action Research Network, sponsored by ALTEC (Advanced Learning Technologies Center) at the University of Kansas, is an online

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5 CARN, http://www.did.stu.mmu.ac.uk/carn/
tool designed for teachers and students that enables them to share their research. PARnet\(^7\) is an interactive community on action research, sponsored and monitored by the Cornell Participatory Action Research Network.

Action research involves risks and costs. Time, energy, and school schedules are the most obvious barriers. Others are lack of research knowledge and skills; fear of criticism or of changing one’s practice; the identity conflict between detached analyst and engaged teacher; lack of administrative support; innovative ideas that conflict with school policy, procedures, or culture; and ethical issues.

Because the improvement of practice is the primary goal, many teacher researchers do not publish reports. However, there is a growing number of teachers writing about their action research, and a great variety of studies ranging from Ruth Heaton’s (2000) highly regarded insider study of how she changed her teaching practice in response to national reforms in mathematics education to Karen Gallas’ (1994) engaging study of her kindergarten classroom to fictional writing as a method of inquiry and reporting (Dadds and Hart, 2001). Action research can be rigorous, flexible, and invite creativity and commitment to improvement. It can be an essential tool for professional development and the fostering of educational communities of practice.

**ONLINE MEDIA FOR COLLABORATIVE LEARNING**

*Online Communication Literacy*

Collaborative learning at a distance relies on online communication, which is significantly different from face-to-face communication. Numerous studies have investigated the characteristics of online communication as compared to face-to-face (see, for example, Brace-Govan and Clulow, 2001; Freiermuth, 1996; Hutchby, 2001; Lantz, 2001; Smith, 2001; Tiene, 2000). Walter Ong (1988) presents a clear and comprehensive discussion of the possible impact of technology on human consciousness and communication by placing it in the context of the history of communication competencies. He begins with orality – the reliance of oral cultures on personal memory and narrative for the perpetuation of ideas and customs. In the move from orality to literacy, Ong states that writing restructured consciousness. Writing

\(^7\) PARnet, http://www.parnet.org/
detaches discourse from its author, thus detaching the word from its embodiment in a particular individual (cf. email and web pages today). In traditional literacy (pre-Information Age), the reader cannot challenge or otherwise engage in dialogue with the writer, except at a distance and after a time delay (e.g., letters).

Writing is passive and artificial, compared to the give and take of the spoken word. Print "technologizes" the word. Though writing is artificial, Ong believes it is invaluable. It encourages us to be reflective, precise, and analytical:

It is essential for the realization of fuller, interior, human potentials. Technologies are not mere exterior aids, but also interior transformations of consciousness, and never more than when they affect the word. Such transformations can be uplifting. Writing heightens consciousness. Alienation from a natural milieu can be good for us and indeed is in many ways essential for full human life. To live and to understand fully, we need not only proximity but also distance. This writing provides for consciousness as nothing else does. (Ong, 1988: 82)

According to Gordon Wells (1999), both oral communication and written communication have roles in inquiry learning and dialogic inquiry. These two modes of communication complement each other in the dialogic inquiry process. Written communication provides a reference and resource for learning, as well as artifacts that are produced as a result of the oral communication activities. For example, a planning dialogue might begin with a list of instructions and protocols and later result in a written plan. The inquiry process as presented by Wells roughly parallels Kulthau's model of the information search process: (1) response to the launch event (Wells) / initiation (Kuhlthau); (2) research and interpretation (Wells) / exploration, collection, and formulation (Kuhlthau); (3) presentation (Wells and Kuhlthau); and (4) review (Wells) / evaluation (Kuhlthau).

As a result of the widespread use of computer technologies for information seeking and communication, a new kind of competency has developed that I call "online communication literacy." This combines features of both oral and written communication. Ong characterizes electronic communication as "secondary" orality. This is a new, self-consciously informal style, characterized by sequential processing and speed. Secondary orality resembles orality in its spontaneity and participatory nature, fostering a communal sense. But it also resembles literacy's deliberateness and self-consciousness. Moreover, unlike primary orality, secondary orality disseminates ideas to geographically dispersed individuals, enabling the spread of knowledge much as publishing did with the advent of the printing press (Eisenstein, 1979).
Unlike the mass distribution of printed publications, however, secondary orality is interactive. (Chart 5 presents a comparison of face-to-face and online communication.)

One can speculate that in online communication literacy – this hybrid of orality and literacy – we may find both greater interiorization as a result of the reflective processes needed for writing and greater openness due to the immediacy and interactivity of online communication.

**Chart 5. Comparison of Face-to-Face (FTF) and Online Communication (OC)**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>FTF Communication</th>
<th>Online Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space/Time</td>
<td>Single place and time; can be costly in time and travel</td>
<td>Unrestricted by space or time (in asynchronous communication)</td>
</tr>
<tr>
<td>Use of Technology</td>
<td>None needed</td>
<td>Technology and software needed; often costly, requires maintenance, troubleshooting, and training to use</td>
</tr>
<tr>
<td>Linguistic cues</td>
<td>Largely verbal</td>
<td>Largely written (e.g., email, discussion groups, chat) due to the expense, sophisticated software, and high bandwidth required for video transmission</td>
</tr>
<tr>
<td>Paralinguistic / nonlinguistic cues</td>
<td>Full range available for use</td>
<td>Written OC limited to graphic representations (e.g., emoticons)</td>
</tr>
<tr>
<td>Nature of exchanges</td>
<td>Can be highly spontaneous and fluid, with no delays in turn-taking and response</td>
<td>Limited spontaneity. In asynchronous OC (e.g., email), time delays occur between responses. In synchronous OC (e.g., chat), communication is erratic—silence or multiple responses simultaneously. Delays in network transmission break conversational continuity. Threads are hard to follow, as more than one thread can occur in a single chat session</td>
</tr>
<tr>
<td>Frequency of exchanges</td>
<td>Can be frequent among talkative participants in lively discussions</td>
<td>More infrequent and time-consuming in both asynchronous OC (e.g., email, discussion groups) and synchronous OC (e.g., chat, instant messaging)</td>
</tr>
<tr>
<td>Time to complete tasks</td>
<td>Can be highly efficient</td>
<td>Requires more time than FTF to complete a given task</td>
</tr>
<tr>
<td>Status consciousness</td>
<td>Range of linguistic &amp; non-linguistic cues to indicate status differences</td>
<td>Sense of greater equality between students and teachers in an online environment (cf. Smith, 2001: 25).</td>
</tr>
</tbody>
</table>

Similarly, telementoring experts Harris and Jones (1999: 39-40) note that “[o]nline interaction exhibits features of both oral and written discourse.” D. E. Murray (1985: 209; as quoted in Harris and Jones, 1999: 40) describes this new hybrid as:

More formal than face-to-face conversation and telephone conversation but less formal than written memos or documents … [It is] semipermanent; can be partly planned; is subject to time delays; and
lacks visual paralinguistic and nonlinguistic cues. The interaction of these characteristics results in complex turn-taking, with turn-taking principles of oral discourse being violated; indication of topic shift; glossing of reference items to avoid ambiguity; less fragmentation than in oral discourse; and the use of graphical representations of paralinguistic cues. (Murray, 1985: 209)

Herbert Clark’s theory of common ground (Clark and Brennan, 1991) provides a theoretical basis for understanding online communication literacy through the costs and resources available in different types of communication media. One of the key tenets in grounding is least collaborative effort: “In conversation, the participants try to minimize their collaborative effort – the work that both do from the initiation of each contribution to its mutual acceptance” (Clark and Brennan, 1991: 135). Grounding changes according to purpose and medium. Face-to-face conversation most efficiently uses common ground to communicate through verbal and nonverbal cues, while other types of communication incur communication costs and trade offs. According to Clark, there are eight “constraints” of communication that affect efficiency: (1) copresence, (2) visibility, (3) audibility, (4) cotemporality, (5) simultaneity, (6) sequentiality, (7) reviewability, and (8) revisability (ibid., p. 141; see Chart 6).

**Chart 6. Communication Constraints in Clark’s Grounding Theory**
(Clark and Brennan, 1991: 135)

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copresence</td>
<td>Communicators share the same physical environment.</td>
</tr>
<tr>
<td>Visibility</td>
<td>Communicators are visible to each other.</td>
</tr>
<tr>
<td>Audibility</td>
<td>Communicators can hear each other.</td>
</tr>
<tr>
<td>Cotemporality</td>
<td>Communicators receive messages at roughly the same time they are produced.</td>
</tr>
<tr>
<td>Simultaneity</td>
<td>Communicators can send and receive at once and simultaneously.</td>
</tr>
<tr>
<td>Sequentiality</td>
<td>Communicators’ conversation turn-taking cannot get out of sequence.</td>
</tr>
<tr>
<td>Reviewability</td>
<td>Communicators can review each other’s messages (i.e., messages are permanently recorded).</td>
</tr>
<tr>
<td>Revisability</td>
<td>Communicators can revise messages for each other (e.g., letters, email).</td>
</tr>
</tbody>
</table>

Clark also describes how these constraints apply to different kinds of media (ibid., p. 142; see Chart 7). Face-to-face communication allows the greatest communication efficiency because it provides the richest array of constraints available for use, while email and letters are the most restrictive because they allow only the constraints of reviewability and revisability.
Chart 7. Constraints and Different Communication Media in Clark’s Grounding Theory  
(Clark and Brennan, 1991: 142)

<table>
<thead>
<tr>
<th>Medium</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face</td>
<td>Copresence, visibility, audibility, cotemporality, simultaneity, sequentiality</td>
</tr>
<tr>
<td>Telephone</td>
<td>Audibility, cotemporality, simultaneity, sequentiality</td>
</tr>
<tr>
<td>Video teleconference</td>
<td>Visibility, audibility, cotemporality, simultaneity, sequentiality, reviewability, revisability</td>
</tr>
<tr>
<td>Terminal teleconference</td>
<td>Copresence, cotemporality, reviewability</td>
</tr>
<tr>
<td>Answering machines</td>
<td>Audibility, reviewability</td>
</tr>
<tr>
<td>Electronic mail</td>
<td>Reviewability, revisability</td>
</tr>
<tr>
<td>Letters</td>
<td>Reviewability, revisability</td>
</tr>
</tbody>
</table>

Grounding also entails certain costs, namely those of formulation, production, reception, understanding, start-up, delay, asynchrony, speaker change, display, fault, and repair. The type of medium determines what grounding techniques are used to compensate for the costs of grounding (ibid., p. 142-145; see Chart 8).
### Chart 8. Costs of Grounding in Clark’s Grounding Theory

*(Clark and Brennan, 1991: 142-145)*

<table>
<thead>
<tr>
<th>Costs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formulation costs</td>
<td>Time and effort needed to formulate and reformulate utterances, depending on complexity of utterance and familiarity of object/concept referenced.</td>
</tr>
<tr>
<td>Production costs</td>
<td>It takes little effort to speak or gesture face-to-face, more effort to type on a keyboard, and most effort to write by hand.</td>
</tr>
<tr>
<td>Reception costs</td>
<td>Listening is generally easy, and reading harder, although it may be easier to read than to listen to complicated instructions or abstract arguments. It also costs to wait while a speaker produces a turn, e.g., online.</td>
</tr>
<tr>
<td>Understanding costs</td>
<td>It is more costly for people to understand certain words, constructions, and concepts than others, regardless of medium. Costs can be compounded when contextual cues are missing, e.g., in email that is not cotemporal or sequential.</td>
</tr>
<tr>
<td>Start-up costs</td>
<td>Costs of starting up a new discourse are minimal in face-to-face where attention getting is easy; more difficult by email where communicator must get access to the right software and hardware, find email address, and start the message. The email message may not reach the addressee, or the addressee may not read the message immediately.</td>
</tr>
<tr>
<td>Delay costs</td>
<td>In cotemporal communication, delay costs are high, as gaps before starting a conversational turn may be interpreted as dropping out of the conversation or disagreeing. Speakers may utter words that have to be revised. In email, delay costs are nil. Delay costs often trade off with formulation costs.</td>
</tr>
<tr>
<td>Asynchrony costs</td>
<td>Face-to-face, communicators time their utterances and communication cues precisely. In media without copresence, visibility, audibility, or simultaneity, timing is much less precise, and without cotemporality, timing is impossible.</td>
</tr>
<tr>
<td>Speaker change costs</td>
<td>In conversation, the general rule is one speaker at a time. Face-to-face turn-taking is easy to arrange. In media with fewer cues, the cost of changing speakers is higher. In online chat, the points of speaker change may need to be indicated by a written convention. Speaker change costs are higher still for letters, answering machine, and email, where it may take much work for one participant to stop and another to start up. One effect of high speaker change costs is that people try to do more within a turn.</td>
</tr>
<tr>
<td>Display costs</td>
<td>Face-to-face, it is easy to point to, nod at, or present an object, and easy for listeners to indicate understanding. In media without copresence, gestures are costly, severely limited, or out of the question.</td>
</tr>
<tr>
<td>Fault costs</td>
<td>Costs associated with producing an utterance fault or mistake. Some faults lead to misunderstanding, others can make the speaker look foolish, illiterate, or impolite. To avoid paying fault costs, speakers may elect to pay more in formulation costs.</td>
</tr>
<tr>
<td>Repair costs</td>
<td>Some repairs take little time and effort, others take a lot, and some are impossible to make. Because faults tend to snowball, speakers try to repair them as soon as possible. In cotemporal media, speakers often make their own repairs. Repairs made by others in non-cotemporal media can be costly.</td>
</tr>
</tbody>
</table>

Olson and Olson (2000) elaborate on the costs of synchronous collaboration online in computer supported collaborative work settings. They use four key concepts as considerations for more effective remote work: (1) Clark’s common ground theory; (2) coupling (dependencies) of work and type of
interaction; (3) collaboration readiness; and (4) collaboration technology readiness. Work that is tightly
coupled with interaction is nonroutine, complex, and depends strongly on the skills of particular groups,
while loosely coupled work requires less frequent and less complex interactions. According to Olson and
Olson, tightly coupled work is very difficult to do online. Collaboration readiness refers to a group’s or
organization’s readiness to share what they know. Olson and Olson recommend not introducing
collaborative software among organizations and communities that do not have a culture of sharing.
Collaborative technology readiness refers to a group’s or organization’s capacity for adopting new
collaborative technologies. Advanced technologies require technological infrastructures, habits of
anticipating others’ information needs and sharing information, and adequate technology support. In
research on the behavior of space physicists reviewed by Olson and Olson, early incarnations of online
behavior resembled face-to-face situations, while later kinds of online collaboration evolved with the users
technical sophistication. It is important to note that these physicists used highly sophisticated technical
tools as part of their collaborations and that not all disciplinary fields have developed such technology. The
authors recommend introducing advanced technologies in small steps, aligned with users’ readiness to
accept and use these technologies.

Online communication requires new skills or new combinations of established oral and written
competencies. The use of computers and online communication may influence the processes of inquiry –
through facilitating, inhibiting, or possibly even changing them. In order to fully utilize the potential of
electronic communication, participants in online communication are required to master a new kind of
communication competency – online communication literacy. This has important implications for the
design of online learning and telementoring programs and the orientation of participants.

**Computer Supported Collaborative Learning (CSCL)**

CSCL is a rapidly growing new area of study “still searching for its foundations; to date, there is little
consensus on theory, pedagogy, technology or methodology – even less in the broader world of learning
stakeholders” (Stahl, 2002b: 1). In an effort to focus discussion and research efforts, Timothy Koschmann
(2002: 20) in his keynote discussion for CSCL 2002 offers this definition: “CSCL is a field of study
centrally concerned with meaning and the practices of meaning-making in the context of joint activity, and the ways in which these practices are mediated through designed artifacts.”

Gerry Stahl (2002b: 1) teases out the implications of this definition, suggesting the outlines of “a new paradigm of learning research” that requires the use of qualitative methods:

It is clear that “meaning and the practices of meaning-making” are here intended as public, observable, socially shared phenomena. This has foundational implications for CSCL research. It does not entail a rejection of quantitative studies of learning outcomes under controlled conditions. However, while these provide important information and ensure empirical grounding, they can in principle never provide the complete story. CSCL is a human science, concerned with its subjects’ own interpretation of their ideas and behaviors. Therefore, CSCL also requires qualitative studies of learning practices — such as thick descriptions that incorporate and explore the understanding of the participants in collaborative learning. As public phenomena, the meanings (learning) generated in collaboration processes can be studied directly, particularly with the help of computer logs and digitized video recordings, rather than just being inferred from post-tests.

Further, Stahl identifies important lacunae in CSCL research thus far, calling for research on the mediating effects of non-digital social, cultural, and learning mechanisms and practices that may shed light on fundamental principles of the mediation of meaning through artifacts to inform the development of software:

Koschmann’s definition of CSCL includes the study of “the ways in which these [meaning-making] practices are mediated through designed artifacts.” He refers here to CSCL technology as mediational artifacts, as software objects designed to support collaborative learning. But this formulation can be taken more generally as raising the questions of how meaning-making is mediated by artifacts. This is an extraordinarily broad issue, since all human activity is meaning-making and everything in our physical, intellectual and cultural world can be considered an artifact: physical tools, linguistic symbols, cultural entities, cognitive mechanisms, social rules ... It is striking that such a fundamental issue has been so little explored. How do different classes of artifact mediate the creation, sharing, teaching and preserving of meaning? A clearer understanding of the functioning of non-digital artifacts might help us understand how to design software to more effectively foster and convey collaborative meaning-making.

This is an emphasis on the sociocultural aspects of learning mediated by artifacts that has close connections to Wells’ concept of the artifacts produced in the knowledge building process.

Some empirical studies also point to the need for more emphasis on the sociocultural aspects of learning online. Lauren B. Goldenberg (2002: 187) notes that instructors and students in a case study of computer mediated communication in a preservice teacher education program “were struck by the relatively superficial nature of most online discourse compared to that of other class activities such as written assignments and in-class exercises.” Despite the instructors’ vision that online communication
would enhance student communication about course topics and related issues, generally the students “did not freely discuss the course topics and current events with one another online” (op cit.). She concludes that some instructors did little to organize the networked learning experience beyond technical demonstrations of use and that this was not sufficient for successful use of computer-mediated communication. She recommends better instructor training, integrating the use of technology into carefully designed classroom activities, and consideration of the important role of emotions in teacher education.

Similarly, Minna Lakkala et al. (2002) investigated a virtual inquiry based learning project aimed at encouraging collaborative knowledge building among middle school students. They developed a “progressive inquiry” model in which “students are guided to engage in a research-like process by defining problems and promoting working theories, using information sources and collaboratively formulating new higher-level problems and explanations” (Lakkala et al., 2002: 443). Analysis of the online communication showed that only 34% of messages were about the content of the inquiry. Moreover, little of this discussion was actual conceptual discourse or formulation of research questions and explanations. The researchers conclude that virtual work requires a different kind of organization than CSCL practiced in face-to-face classroom situations, such as agreements on collective work habits, a communication channel for coordination, and more well structured process with commonly known and accepted goals, rules, and evaluation principles.

While the majority of research in CSCL has been done in K-12 contexts, higher education is receiving greater attention (Strijbos et al., 2004), with some research beginning to converge under the rubric of “networked learning” (Goodyear et al., 2004). This work recognizes the importance not only of technological affordances but also educational and social affordances (Jarvela et al., 2004; Kreijns and Kirschner, 2004; Kirschner, Martens, and Strijbos, 2004; Lund, 2004; Stahl, 2004). Kirschner, Martens, and Strijbos (2004: 14-15) define educational affordances as “the relationships between the properties of an educational intervention and the characteristics of the learner that enable particular kinds of learning.” Social affordances are “the properties of a CSCL environment that act as social-contextual facilitators relevant for the learner’s social interaction” (op cit.).
Jarvela et al. (2004) identify a number of scaffolds that constitute instructional support in CSCL—scaffolding the process of collaboration, cognitive scaffolding, and motivational scaffolding. The challenge is that “[s]ome of the most important processes in human communication, like creation of mutual understanding or shared values and goals, are hard to reproduce in the Web-environment” (ibid., p. 134).

Based on a review of the literature, Lund (2004: 167) discusses the limited way that human support is most often portrayed in the CSCL literature—“solely from the instructor’s point of view and not as an inherent part of a co-constructed interaction.” She discusses types of human support, such as tutors supporting students, students supporting each other, and tutors supporting each other. One could add students supporting teachers as well. Among the conclusions that she draws for higher education are: (1) both students and tutors (who may spend long hours monitoring student contributions and replying to student queries online) need high levels of intrinsic motivation, good time management, and increased levels of human support; (2) students’ views of the teaching-learning process influence whether they solicit support; and (3) teachers’ visions of the teaching-learning process influence the kinds of support they give (e.g., whether teaching is seen as a transmission process or a discovery learning process).

**Telementoring Research and Programs**

Telementoring, the newest form of mentoring, involves the use of technology to facilitate or support mentoring, a form of learning that is based on relationship building. The International Telementor Program identifies some unique advantages of telementoring over traditional mentoring. It matches students with appropriate mentors without geographic limitation, allows communication to take place asynchronously, creates an archive of all communication, and provides the opportunity for students to work on long-term projects with their mentors. Telementoring also presents some unique challenges. Communication is typically limited to text. Participation requires solid technology infrastructure and support. Regular, frequent communication is critical and requires facilitation by a teacher who provides critical feedback about the program, barriers, challenges and successes to the mentors that the student mentee cannot see or articulate.

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Some experts emphasize that in any mentoring relationship, the relationship and the program take precedence over the use of technology. Jayne Cravens, the Online Volunteering Specialist for the United Nations Volunteers program and former director of the Virtual Volunteering Project, states, “[A] well-designed program is going to work whether it’s done online or face-to-face; technology is secondary” (Cravens, 2002).

However, others such as Judi Harris, Director of the Electronic Emissary Project at the University of Texas at Austin, notes that program structure and support are the critical and costly issues in telementoring: “Ementoring efforts need to be carefully planned, well-staffed, and sufficiently funded. Done well, they are relatively expensive … much more expensive than most organizations starting them seem to understand. Most of that expense needs to go toward paying experienced facilitators for their work in making the program work: planning, prompting, supporting, consulting, suggesting, formatively evaluating, troubleshooting” (Harris, 2002).

Kevin O’Neill (2002) feels that telementoring and face-to-face mentoring are significantly different because of the use of technology:

[T]here is a big difference between e-mentoring and face-to-face mentoring. One of the differences … is the degree to which e-mentors are reliant on their mentees to explain where they stand and what their needs and frustrations are. In a face-to-face relationship, the mentor often has opportunities to observe the mentee casually, or to speak with his or her friends, parents and teachers. So, if the mentee is holding back for some reason, there are other ways to uncover what his or her needs might be. In contrast, it’s very easy for an ‘ementee’ to sabotage the mentoring relationship (intentionally or unintentionally) … by not sending messages, by sending very curt, uninformative ones, or by sending defensive messages that obscure confusions rather than uncovering them.

O’Neill emphasizes that telementoring should never be a replacement for face-to-face mentoring, “Particularly in the case of programs aimed at children at high risk of failure in school, school violence, etc., there may be no substitute for face-to-face mentoring” (O’Neill, 2002).

O’Neill and Gomez (1998) investigated 26 long-term telementoring relationships between students in grades 7-12 conducting scientific inquiry projects and volunteer scientists. The findings showed that only 65% of the relationships progressed as far as discussing domain-related information, with 35% being considered abortive dialogues. In the more successful relationships, students valued the guidance from the scientists, who helped them focus their topics and set a research agenda. Telementors provided a higher quality of advice than to students than the classroom teacher was able to give. Among the limiting factors
were the “low visibility” of students’ work to their mentors and mentors giving too much or too little help. Sociability and developmental readiness were important issues for both students and mentors. Among a number of mentoring partnerships, there seemed to be a need to get to know each other before the curriculum content was focused upon. Recommendations of the study include: (1) student work needs to be made more visible to mentors than is likely with email alone; and (2) teachers must have appropriate organizational tools to reduce the management overhead.

One of the longest running national telementoring projects is University of Texas at Austin’s Electronic Emissary Project. This project has spawned a number of research papers and dissertations investigating the benefits and challenges of telementoring. Unlike Kevin O’Neill’s work with students and mentors who communicate directly with each other, facilitated by a teacher, the Electronic Emissary (EE) utilizes facilitators who act as mediators between subject matter experts (SMEs), students, and teachers. James Gregory Jones (2001) analyzed communications between SMEs and individual students and found that participants’ schedules, different age groups, and technical circumstances influence communication and how participants’ roles changed during discourse.

Of particular interest for this study is the work done by Harris and Jones (1999) and Jones (2001) analyzing the messages among K-12 students, SMEs, and teachers. Their work focused on the functions, frequency, and flow of messages, utilizing discourse analysis of speech acts. Jones (2001: 301) identified the following message functions: (1) Reporting/Requesting Information: Content Information, Procedural Information, General Information, Personal Information, Idea/Opinion/Emotion, Resource, and Feedback. (2) Other: Salutation, Planning, Thanking, Complaining, and Apology.

Even though the ten projects Harris and Jones (1999) studied were designed to foster student inquiry within a teacher-designed, content-related curriculum, results showed that adults communicated more frequently online than students did, and student speech acts commonly dealt with the reporting of information, especially personal and general information, and ideas, opinions, and emotions.

Harris and Jones conclude that analyzing online speech acts alone is insufficient to show the full range of learning, and that analysis should include “the effects of the exchange on the social and instructional climate of the classroom” (Harris and Jones, 1999: 52). They state (1999: 52-53), “We will be
much better prepared to describe the learning and teaching contexts in which powerful use is made of educational telecomputing tools when we can fit a detailed and clearly-conceived view of online exchange into a similarly configured description of face-to-face interaction in the telecommunications-enhanced classroom."

These studies on telementoring raise important issues for the design and implementation of online learning and telementoring to support constructivist learning online. They raise important questions about the appropriate balance between social factors and technology functions to support and augment online collaborative learning.

**SUMMARY: DIALOGIC INQUIRY FRAMEWORK**

This chapter has examined the discourses on constructivist learning, action research, and computer supported collaborative learning that serve as the foundation for this study of online learning and telementoring. The fundamental premise underlying this review is that social constructivism is the means by which we learn and make shared meaning. Affect and relationship building have been identified as important aspects of collaborative learning. Important distinguishing features and challenges of online communication and learning have also been described.

In inquiry learning, self-efficacy can be one of the most important tools for self-empowerment. Self-efficacy and intentional conceptual change play an important role in online learning under the conditions of this research project. All the participants (graduate students and high school students) have a large measure of control over their own learning. They select, plan, conduct, and reflect on their own research. Mentors are challenged to foster the development of self-efficacy through motivating students, scaffolding the use of cognitive and metacognitive skills, providing feedback, and building relationships that model and support critical thinking.

Dialogic inquiry is the primary means of inquiry learning. Dialogic inquiry is a holistic, interactive process of coming to know with others, involving cognitive, affective, and social dimensions and an orientation to purposeful action. Participants bring their own experiences and interpretive frameworks to the dialogic inquiry process, utilize information in the public sphere that has resulted from other dialogic
inquiries, and build knowledge and create artifacts as they jointly pursue a particular activity. The goal of dialogic inquiry is understanding.

Conceptualizing telementoring as online dialogic inquiry provides a framework for interpreting evidence of inquiry learning in online conversations and course work. Based on the ideas of Wells (1999), Boud et al. (1985a), Bandura (1997), and Mezirow (2000), the pedagogical framework used for the educational interventions in this case study features the following elements (see also Figure 2):

- The resources that individuals bring to the learning process are affective and cognitive self-efficacy, experience, knowledge, understanding, and motivation.
- Learning takes place through a dialogic inquiry process that is cognitive, affective, interactional, and transformational.
- In online dialogic inquiry, individuals use their personal resources and information presented in the course to co-construct knowledge and create, use, and improve representational artifacts while reflecting throughout the process.
- The desired learning outcomes are higher self-efficacy, transformational experience, and transformed understanding.

Figure 2. Dialogic Inquiry Framework
CHAPTER 3. METHODOLOGY

INTRODUCTION

Consistent with my belief in narrative as a way of thinking and as evidence of social constructivism in action, I will present the considerations for using narrative analysis in part as stories about how I arrived at the use of the method. Its main features, analysis and interpretation issues, methodological advantages and disadvantages, and procedures are discussed.

This case study emerged from a winding path of unexpected challenges, adaptation, and discovery. The genesis was my work as a research assistant for the Hawai‘i Networked Learning Communities (HNLC), a project funded by the National Science Foundation under its Rural Systemic Initiative program. HNLC focuses its efforts on professional development for rural teachers. In early 2002, telementoring was planned to help rural teachers and students “bridge the waters” through online communication and learning. Telementoring is “using telecommunications technology ... to develop and sustain mentoring relationships where face-to-face [mentoring] would be impractical” (O’Neill, 2000: iii).

As is common in complex educational settings, factors intervened to prevent the launch of telementoring. I then developed a project with a high school library media specialist. Under her supervision, two high school students conducted individualized senior research projects with a career focus during the school year 2003-2004. They were telementored by two graduate students in the Library and Information Science (LIS) Program, University of Hawai‘i at Mānoa. From January-May 2004, I also conducted an online action research course with the same LIS students to provide the means to turn their telementoring work into a professional development opportunity. Due to lack of communication related to the senior projects, I refocused my research on the online action research course.

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9 HNLC Principal Investigators are Violet Harada, Professor, Library and Information Science Program, University of Hawai‘i at Mānoa; Daniel Suthers, Associate Professor, Department of Information and Computer Sciences, University of Hawai‘i at Mānoa; and Victoria Kajioka, Director, Advanced Technology Research Branch, Hawai‘i Department of Education.
10 http://www.ehr.nsf.gov/esr/programs/rsi/
STUDY PURPOSE AND DESIGN CONSIDERATIONS

The original study of telementoring examined the affective and interactional dimensions of online communication, in particular how telementors attempt to encourage and sustain student motivation and support the development of self-efficacy. The focus of the original study was process not content, i.e., student progress in inquiry learning, irrespective of the topics the high school students chose to research. The aim of this study was to examine how affect and interaction influence participant understanding of action research. This involved attention to course content as well as process. The exploratory research questions that addressed these were:

- What are the key cognitive, affective, and interactional elements of the online conversations?
- How do student-instructor interactions influence student understanding in the action research course?
- How do student-instructor interactions influence course development?

My role as researcher changed from outside observer of the telementoring interactions to full participant-observer in the action research course. Although improvement of my teaching was an important goal, I rejected action research and design-based research approaches because my primary research interest was to examine the affective and interactional dimensions of collaborative learning. Although I consulted with the participants and other researchers during the analysis, I worked primarily as a single researcher.

A case study approach using discourse analysis methods was chosen. Each case was clearly bounded: individual student learning within the one-semester action research course. These cases were then compared. The advantages of case study are its capacity to: (1) provide rich description; (2) examine complex phenomena; (3) build theory; (4) study process; (5) study subjective factors such as thoughts, feelings, desires, and motivation in context; and (6) form the basis for evaluation and improved future action (Merriam, 2001: 40-42).

According to Robert Yin (1994: 1), case study is good at answering “how” and “why” questions, especially if the researcher does not have control over events, and when events are unique. Case studies also allow better access to subjective factors than experiments or instruments such as surveys, which are designed to generalize across individuals and phenomena. In characterizing case studies, Yin (ibid., p. 13) states that:
A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident. The case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence with the data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis.

Yin notes that cases are not “sampling units”; rather, that “individual cases studies are to be selected as a laboratory investigator selects the topic of a new experiment. Multiple cases, in this sense, should be considered like multiple experiments” (ibid., p.31).

The special features of a qualitative case study are that it is: (1) particularistic, (2) descriptive, and (3) heuristic. The case study focuses on a particular group, event, or phenomenon, not on generalities applied over a class, though hypotheses and insights about a class of things often do emerge from a case study. A case study is always limited by the subjectivity of the researcher, as well as the need to focus the findings to answer the research questions.

My decision to do a case study that examines all relevant aspects of social constructivist learning meant that the research questions were necessarily broad. Case studies are highly contextual, but the aim is to find generalities in particulars. Jerome Bruner (1996: 133-137) discusses this “generic particularity” as one of the characteristics of narrative used when humans construct a “narrative construal of reality.”

Frederick Erickson considers the aspects of a case study to be “concrete universals” that are “arrived at by studying a specific case in great detail and then comparing it with other cases studied in equally great detail” (Erickson, 1986: 130; as quoted in Merriam, 2001: 210). Erickson explains:

When we see a particular instance of a teacher teaching, some aspects of what occurs are absolutely generic, that is, they apply cross-culturally and across human history to all teaching situations. This would be true despite tremendous variation in those situations – teaching that occurs outside school, teaching in other societies, teaching in which the teacher is much younger than the learners, teaching in Urdu, in Finnish, or in a mathematical language, teaching narrowly construed cognitive skills, r broadly construed social attitudes and beliefs … Each instance of a classroom is seen as its own unique system, which nonetheless displays universal properties of teaching. These properties are manifested in the concrete, however, not in the abstract. (op cit.)

Through the concrete particulars of this study, described in detail, I hope that it can be compared to other studies examined in equally great detail to arrive at the “concrete particulars” of teaching and learning online from a social constructivist perspective.
The differences between face-to-face and online communication within educational contexts has been explored in Chapter 2. These same differences affect the use of discourse analysis methods in online environments. Christine Hine (2000: 63-65) has developed a set of principles and assumptions for virtual ethnography. Those relevant to this study are:

- Because cyberspace is not space or time bound, the object of ethnography concentrates on connectivity and flow rather than location and boundary as organizing principles.
- Virtual ethnography is interstitial, fitting into other activities and contexts of both the ethnographer and the subjects, so immersion in the setting is only intermittently achieved.
- Virtual ethnography is necessarily partial. A holistic description of any informant, location, or culture is impossible to achieve.
- Virtual ethnography involves intensive engagement with mediated interaction. The ethnographer’s engagement with the medium is a valuable source of insight. The shaping of interactions with informants by the technology is part of the ethnography, as are the ethnographer’s interactions with the technology.
- New technologies make it possible for informants and ethnographer to be absent and present to each other, enabling these relationships to be fleeting or sustained and to be carried out across temporal and spatial divides.
- Virtual ethnography is adaptive ethnography that suits itself to the limited conditions of mediated interaction.

In this study, fuller descriptions of the setting were possible than Hine indicates, because of my involvement over several years with the LIS Program and its students.

Though ethnography in virtual settings is limited compared to face-to-face, it also has certain advantages. Rather than relying on the ethnographer to transcribe spoken language and interpret nonverbal cues, online communication logs capture communication activity precisely, entirely, and stamped with date and time. This removes the need to interpret at the level of data transcription but increases the burden of interpretation at the various levels of data analysis. Thus, data triangulation is especially important.

One of my intentions was to use theory to inform practice, particularly related to online collaborative learning. Most studies in computer supported collaborative learning (CSCL) have emphasized the cognitive dimension of computer mediated communication and collaborative learning. My belief that affect plays a critical role in online communication and learning, particularly where coaching or mentoring is involved, is supported by the literature reviewed in Chapter 2. Many CSCL studies have also used quantitative, experimental methods to examine learning factors and software functions or programs. In recognition of the
limitations of these approaches, some leading CSCL scholars and researchers have called for a greater focus on the social dimensions of CSCL (Koschmann, 2002; Lipponen, 2002) and a greater use of qualitative methods (e.g., Stahl, 2002b). Researchers on telementoring have also debated the role of technology, with differing views about how technological and social factors should be balanced (Harris, 2002; O’Neill, 2002).

I believe that learning is a holistic process that can only be partially understood through quantitative measures. Chapter 2 presented theories and research that support this view of learning involving affect, cognition, and interaction. Different from many studies in CSCL, this study emphasized an examination of the roles of affect and interaction in learning. The dialogic inquiry process that is central to Gordon Wells’ sociocultural theory of education (see Chapter 2) was adapted to develop a holistic learning framework upon which to base the design of the action research course (see Chapter 2, Figure 2, “Dialogic Inquiry Framework”). Self-efficacy (Bandura, 1997) and concepts from transformational learning theory (Mezirow, 2000) were integrated into the framework. The implicit aim of this study was to explore, in an online context, a pedagogical framework that presents a holistic view of learning. The research questions were posed as broadly exploratory in order to attend to the factors that might be most influential in determining its appropriateness. While the framework was not originally conceived as a narrative learning framework, the study’s findings led to this revision (see Chapter 7).

I chose to use the simplest, most flexible online collaborative software available to me, because I believed it to be most fitting for my pedagogical and research purposes. Structured software with many built-in functions often predetermines the paths used for achieving learning goals and communication tasks. My aim was not to test specific technological functions but to analyze the online conversations and participants’ assessment of these conversations to identify techniques, strategies, patterns, and processes toward skills attainment and the development of self-efficacy.

Philippa Levy’s conduct of a similar study under somewhat different conditions provides support for my decision to conduct a case study of a course designed and implemented by myself as full participant observer. A university teacher, Levy designed, implemented, and conducted a case study evaluation of a networked professional development course for information services staff in higher education. She
developed a pedagogical model for the course, based on constructivist perspectives and experiential learning, that aimed to “support self-managed, collaborative learning in what was for all participants a new type of learning environment” (Levy, 2004: 44). Her methodological approach was practice-based, participatory action research. Her data sources were similar to those used in this study – online data, face-to-face interviews, and a questionnaire. Issues she faced in doing “networked action research” were similar to those in this study: (1) the appropriate use of subjectivity and reflexivity; (2) tensions in the research relationship between participants; (3) judgments about representation in the case narrative; (4) validation criteria for the research approach; and (5) the basis for the study’s claims for both improving practice and building theory.

**Data Collection and the Learning Framework**

Data triangulation was used to provide multiple sources of evidence on the phenomena observed. To guide data collection, data sources were initially aligned with the features of the learning framework. Figure 3 indicates the components of the Dialogic Inquiry Framework, linked to their logical data sources. Though this provided a general guide, the boundaries among the categories were ambiguous, as activities and interactions ranged over the variety of data sources. For example, while one student, Ruth, used journals as her primary tool for reflection, the other student, Sarah, used email messages and wiki pages as well as journals to write her reflections. The early Ruth-instructor dialogue on focusing the research question took place primarily through comments on wiki pages, while the early Sarah-instructor dialogue on focusing the research question took place through email exchanges.

The data were captured mainly by computer. The online workspace used wiki-style collaborative software, with added email and chat software programs dedicated to the project. Online data included: (1) email messages, (2) journal entries, (3) “wiki” pages and comments on those pages, (4) chat transcripts, and (5) server logs. The few face-to-face meetings and interviews were audio recorded and transcribed or summarized. A final questionnaire about the course was administered. Face-to-face class meetings were audio recorded and summarized. Face-to-face interviews were audio recorded and transcribed. A final questionnaire about the course was administered. The technical aspects and research functions of these data sources are discussed below. The pedagogical functions are described more fully in Chapter 4.
Figure 3. Dialogic Inquiry Framework and Data Sources

INDIVIDUAL RESOURCES
Self-Efficacy (Affective, Cognitive) Experience, Knowledge, Understanding, Motivation

DIALOGIC INQUIRY
Cognitive, Affective, Interactional, Transformational
Use information To co-construct knowledge Construct, use, improve representational artifacts Reflect

LEARNING OUTCOMES
Higher Self-Efficacy, Transformational Experience, Transformed Understanding

EMAIL
Course business Course content Research project Telementoring Personal

CHAT
Course content Research project

WIKI PAGES
Module writings Module comments Module questions Chat summaries Independent pages Research proposal Research report

JOURNALS
Action research Telementoring Aha's Follow-up comments

INTERVIEWS
Pre-course Post-course

= Indicates data sources.
The technology used for creating the online workspace was WikkiTikkiTavi\textsuperscript{11}, a free, open source wiki-style collaborative software program. Users with even limited technical knowledge can freely create, edit, and link to their own web pages. This is discussed in Chapter 4. Features included the ability to format text and simple tables. Server activity logs captured the following data: (1) page action (read or edit) by title, user, date, and time; (2) archived contents of pages and comments; (3) email activity by sender, recipient(s), date sent, date read, message subject, message body, and attachments; and (4) chat transcripts including date, time, name of participant, and message. All participants were aware that the researcher was able to read all email messages.

An email program designed by the project’s technical advisor was installed to function within the website, which was password protected. A feature was added to alert participants to new wiki email via their external email accounts using PHPMailer\textsuperscript{12}, a free, open source program. Email could be “deleted,” but doing so simply moved the message to a special folder accessible to the participant at all times. The chat program used was SimpleChat! 1.3\textsuperscript{13}, also free and open source. Features included text formatting and a selection of emoticons. Participants were asked to keep weekly journals to document their learning process related to their telementoring with the high school student, research projects, and learning discoveries (“aha’s”). The journals provided the participants’ views of their experiences and helped clarify goals, motivations, and intent. The researcher maintained a journal of notes on teaching, research, and personal reflections.

Four face-to-face class meetings occurred— at the beginning of the course, for two of the fourteen class modules, and at the end of the course. Initial interviews were conducted with all participants (see Appendixes E and F). Final interviews using questionnaires were conducted with the graduate students (see Appendix G). All face-to-face exchanges were audio recorded and transcribed or summarized.

**Discourse Analysis: Structure, Process, and Interaction**

Discourse analysis provides a variety of methods, some more appropriate for analyzing text and others more fitting for conversation. The online communication in this study resembled features of both. The chats

\textsuperscript{11} http://tavi.sourceforge.net/WikkiTikkiTavi
\textsuperscript{12} http://phpmailer.sourceforge.net/
\textsuperscript{13} http://hot-things.net
resembled real-time conversations with individual turn taking related to generally distinct topics. However, the asynchronous email messages were lengthier than chat responses (sometimes well over 1,500 words), addressed multiple topics, and resembled letters more than conversational exchanges. In addition to this distinction between text and talk, Teun van Dijk (1997) provides another set of useful distinctions: discourse as structure, process, or social interaction. For this study, I viewed “structure” as the conceptual structures for understanding action research, “process” as the mental processes (cognitive and affective) involved in learning, and “interaction” as participant interaction to support learning. I considered potential discourse analysis methods using all of these distinctions as guides. My aim was to look for evidence of a correlation between interaction and student progress in understanding the core concepts of action research.

To examine student understanding of core concepts of action research as well as the mental processes involved in learning, I first attempted to use grounded theory coding (Strauss and Corbin, 1998) with the eventual aim of doing content analysis based on the emerging codes. These methods initially seemed appropriate because they address structure and accommodate both text and talk. However, both had limitations when applied to uniquely different student learning experiences. Content analysis focuses on core constructs, not individual experience, and reliability is established through multiple coders. Quantitative measures such as word frequency counts are often used. While grounded theory coding can be applied flexibly, its focus identifying abstract concepts and static variables led me away from the complex, dynamic processes the students exhibited. The two students were engaged in different learning processes, valued different course readings, and produced significantly different kinds of research studies and final reports as a result. In short, they achieved different but equally valid understandings of action research. Limiting the analysis to a point-by-point comparison eliminated important and valuable differences and led to reductionism. Such a comparison also failed to capture in depth the understandings that were most valued by the students themselves. In addition, the large total word count of approximately 164,280 words was a significant challenge to doing content analysis and grounded theory coding.

De Laat and Lally (2004: 33) came to similar conclusions related to the use of content analysis to examine the online discourse of graduate students participating in an online course. Their use of content analysis “enabled a tentative identification of patterns of individual and group learning.” Sampling of
messages and discussion threads was necessary to cope with the large volume of data. They concluded that the nature of learning and tutoring in the networked environment is "so complex that no single theoretical model, among those currently available, is sufficiently powerful, descriptively, rhetorically, inferentially or in its application to real contexts, to provide a framework for a research agenda that takes into account the key aspects of human agency" (ibid., p. 11). They state that the research challenges of this type of examination require multi-method and innovative approaches. They note that the use of coding schemas is "beset with difficulties" and limitations (ibid., p. 34-35):

The coding schemas required to capture the complexity of the activities were necessarily complex in themselves ... Some passages of text could have been coded using more than one category, because of the multiplicity of meanings that could be inferred from the text ... Given these difficulties, the use of coding in this way is still only a partial solution to the methodological challenges we identified ... Of course coding provides little insight into a key aspect of the individual and group processes: those that were not expressed in text messages. We have argued for the need to complement coding analysis with several complementary forms of analysis in order to understand more fully the richness of these learning interactions. In this study we have combined coding analysis with critical event recall ... The recollections presented here suggest that the tutor engaged in many reflective and analytical observations about his own facilitation of the group and the behaviors of individuals within it, yet much of this thinking was not directly observable in the transcripts of the group's work ... Critical event recall has the potential to access aspects of learning and tutoring processes that are not directly available in discussion transcripts. Further more, this tool can complement content analysis in an important way by using its results to probe "the thinking behind the text" in collaborative work within learning communities in networked environments.

They complemented content analysis with the use of critical event recall – similar to this study's use of narrative element of complicating action (discussed below). In this study, the "thinking behind the text" referred to by the authors were available from the observations of the researcher as full participant observer and from the students through the organized reflections and analyses presented in their final papers.

To examine interaction, I first attempted to use conversation analysis. Conversation analysis (CA) provides the means for a detailed analysis of how we cooperatively achieve something through talk. The basis of CA is the idea that "conversations are orderly, not only for observing analysts, but in the first place for participating members" (Schegloff and Sacks, 1973: 290). This orderliness is known as conversational coherence, i.e., how a conversation holds together through patterns of meaning. These patterns may be limited to the organization of the conversation itself (e.g., sequencing), or seen in connection to the context (e.g., cognitive structures or social structures). CA is an inductive, ethnomethodological approach and looks at both the unique meaning of an utterance and the systematic aspects, mechanisms, and procedures
of a conversation (Have, 1986). Some researchers have found CA applicable to online communication (e.g., Hutchby, 2001; Ruhleder and Jordan, 2001; Slack, 1998; Vallis, 2001).

Gordon Wells’ work with DICEP (Developing Inquiring Communities in Education Project) appears to be a type of CA and was seriously considered as a model for this work. DICEP used discourse analysis based on systemic functional linguistics (particularly the work of M.A.K. Halliday) and activity theory to analyze classroom discourse in a longitudinal, collaborative action research project involving schoolteachers and university researchers (Nassaji and Wells, 1999). The influence of triadic dialogue (Initiation-Response-Follow-up, or IRF) on inquiry learning was investigated in a variety of subject disciplines. Through a process resembling grounded theory coding, an elaborate scheme was developed that addressed speech segmentation (episode, sequence, exchange, move) and activity orientation (organizing, problem-solving, planning, generating, reporting, constructing, launching, formulating, monitoring, reviewing). The focus on interaction is clearly visible, for example, in types of follow-up moves: accept, reject, correct, reformulate, counter, praise, amplify, exemplify, connect, summarize. However, affective states and relations were not coded. In addition, when online exchanges consist of long email messages that address multiple topics and “interactive” journals, the complexity for analysis is manifold.

I considered CA to be appropriate for chat transcripts but not for other types of exchanges (email, student journals with commentary, wiki pages with commentary, research proposals and final papers with commentary). In terms of volume of words produced, chat sessions constituted less than twenty percent of the students’ online course activities. In addition, one of the students rated the chat sessions as least important for her learning (ranked ninth). Because significant interactions took place through other media that were more highly valued by the students than the chat sessions, other methods were necessary to examine these interactions.

I also considered discourse analysis based on speech act theory (Austin, 1962; Searle, 1969) to address structure in talk. Researchers Harris and Jones (1999), studying the Electronic Emissary project at the University of Texas at Austin (the oldest U.S. telementoring project), used discourse analysis of speech acts to analyze the messages among K-12 students, subject matter experts, and teachers. The categories used were: Content Information, Procedural Information, General Information, Personal Information,
Idea/Opinion/Emotion, Resource, Feedback, Salutation, Planning, Thanking, Complaining, and Apology. They also noted frequency and flow of messages. They concluded (and I concurred) that this type of analysis of online speech acts alone is insufficient to show the full range of learning.

Because the students used the communication media differently to express themselves, it was increasingly necessary to attend to the uniqueness of the learning experiences. I reviewed the entire corpus of computer-captured recordings of chat sessions, email messages, wiki page contents and comments, as well as transcriptions of face-to-face interviews and summaries of 4 face-to-face class sessions. This occurred primarily through iterative scrutiny of the data during my initial attempt to use grounded theory coding. As I read and reread the data, I was continually struck with the differences between the two students - their written answers and chat responses to weekly discussion questions posed by the instructor, the readings they preferred, the manner in which they cognitively processed the core concepts as revealed in their reflective writings, the types of pre-discussion questions posed before our weekly class sessions, their significant realizations (self-reported as “aha’s”), and their ways of interacting with me as instructor, as well as other differences.

As I tried to identify “the key cognitive, affective, and interactional elements” to address my first research question, I found that the answers were different depending on the student. Rereading the students’ final papers, it finally “clicked” for me that the students were telling rich, detailed stories about their learning that would not be captured through grounded theory coding. Had the students not been so dissimilar, I probably would not have realized this and would have continued using grounded theory coding, perhaps reifying my observations as conclusions and recommendations that would later prove to be unwarranted by further research. Even with these differences, I am well aware of the fact that there were only two students in this study. The typology that associates reflection and co-reflection styles with preferences for research methods is an attempt to acknowledge this limitation and use the preliminary, tentative findings of this study to sensitize me to recognize alternative conclusions in future research (see Chapter 7, Chart 48).

To account for and describe the uniqueness of the learning experiences involving cognition, affect, and interaction, I turned to narrative analysis. Catherine Kohler Riessman (1993: vi), one of the leading
experts in the use of narrative analysis in the social sciences, describes her process of discovering narrative
analysis in a way that parallels my own discovery:

Narrative and sociology got connected for me in the 1980s during a research project on gender and
divorce ... In structured interviews, women and men seized every opportunity in the conversation to
tell about their experiences. Some developed long accounts of what had happened in their marriages
to justify their divorces. I did not realize these were narratives until I struggled to code them.
Applying traditional qualitative methods, I searched the texts for common thematic elements. But
some individuals knitted together several themes into long accounts that had coherence and sequence,
defying easy categorization. I found myself not wanting to fragment the long accounts into distinct
thematic categories. There seemed to be a common structure beneath talk about a variety of topics.
While I coded one interview, a respondent provided language for my trouble. As I have thought about
it since, it was a “click moment” in my biography as a narrative researcher. Asked to state “in his own
words the main causes of his separation,” the man laughed and said, “Well, you know, that’s a real
long story, but maybe I can sum it up by saying ...” I saw how others tried to tell long stories about
their experiences in marriage and after, despite my best efforts to be a good social scientist,
standardize interview procedures, elicit data that were comparable, and code them into a common set
of thematic categories. Individuals recapitulated and reinterpreted their lives through story telling.

Stories are a way of thinking and making meaning; narrative analysis can be used “to explore the
semiotic, cognitive, and sociointeractional environments in which narrative acquires salience and to which
stories in turn lend structures” (Herman, 2003: 3). Unlike most approaches in social and cultural studies,
narrative analysis does not “shy away from uncertainty, complexity, and polarization” (Roe, 1998: 17).
Narratives and life histories thrive because of subjectivity – they convey the fullness of thoughts and
feelings and the richness of human experience. They “exist somewhere between history and memory”
(Tierney, 2000: 545). Narratives reveal concerns and vulnerabilities, help create identity and social reality,
and sometimes trigger transformations. “Precisely because they are essential meaning-making structures,
narratives must be preserved, not fractured, by investigators, who must respect respondents’ ways of
constructing meaning and analyze how it is accomplished” (Kohler Riessman, 1993: 4). Narrative analysts
use both text and talk to construct a holistic view involving cognition, affect, and interaction.

The use of narratives and narrative analysis in this study is based on the premise that narrative is a
cognitive tool. In his overview of narrative psychology, V.W. Hevern (2004) discusses some of the ways
that cognitive researchers are approaching this issue: (1) narrative, parable, and metaphor as fundamental
elements in everyday cognition (Fauconnier and Turner, 1998; Turner, 1997); (2) the development of
narrative skills among children; (3) Robert Schank’s script theory and case-based reasoning as keys to how
humans think (Schank, 1995); (4) Alexander Luria’s (1972) work showing that brain damage can disrupt
narrative production and comprehension ability; and (5) the emergence within the field of artificial intelligence of “a new subfield which is called Narrative Intelligence,” concerned with the construction of systems that humans can interpret as narrative. To the work on narrative cognition, one can add the contributions of David Herman (2003) and Leonard Talmy (2000) that link narrative structure to human conceptual structure, as well as work that relates children’s use of narratives to later mathematical thinking ability (O’Neill, Pearce, and Pick, 2004). Narrative intelligence researchers are also pursuing the development of “cognitive architectures for socially intelligent agents, agents with emotions, [and] design issues for interactive systems” (Dautenhahn, 1999). Dautenhahn and Coles (2001) elaborate on different levels of narrative intelligence in the context of human and robotic story-tellers.

**Features of Narrative Analysis**

“A minimalist definition of narrative might be ‘a perceived sequence of nonrandomly connected events’” (Toolan, 1988: 7). A story is represented by a plot that conveys meaning through both its narrative content and its discourse. A plot consists of sequential and consequential events – “the events in the story must disrupt an initial state of equilibrium that sets in motion an inversion of situation, a change of fortunes – from good to bad, from bad to good, or no such reversal of polarity, just an ‘after’ different from the ‘before’” (Franzosi, 2004: 57).

Because the unit of analysis is the plot, the narrative as an essential meaning-making structure is not fragmented (as noted by Kohler Riessman above). The implications of this for analysis are that the cognitive, affective, and interactional characteristics of learning that might be separately coded using other discourse analysis methods retain their unity with particular actors and actions within a narrative. For example, feelings of frustration or encouragement are linked to the specific concepts, thinking processes, and interactions of particular individuals within a particular context. All of these together constitute the unit of analysis – the narrative.

Narratives may be simple accounts of a single event, but multiple narratives are common in complex situations. The most encompassing of multiple narratives is the primary narrative. According to Gerald Prince (2003: 78), a primary narrative is “a narrative the narrating instance of which introduces one (or more than one) other narrating instance and is not itself introduced by any ... Of course, a primary narrative
is not necessarily more important or interesting than the one(s) it introduces; indeed, the opposite is often true.” Narrative analysis attends to both content (story) and expression (discourse) (Prince, 2003: 17, 21). When a primary narrative encompasses a broad span of time (the literary parallel is the novel), sub-narratives provide the detail needed for the reader’s fuller understanding.

Regarding the structure of a story’s content, William Labov’s (1972) linguistic definition of narrative provides a well-used typology of categories: (1) abstract, (2) orientation, (3) complicating action, (4) evaluation, (5) result or resolution, and (6) coda. The simpler Aristotelian narrative structure consists of beginning, middle, and end, where “middle” corresponds to “complicating action.” An essential story grammar can be constructed from these narrative elements using definitions from Prince (2003), as outlined in Chart 9.

**Chart 9. Elements in a Story Grammar**

<table>
<thead>
<tr>
<th>Item</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>The part of the narrative that summarizes it and encapsulates its point, or main thrust.</td>
</tr>
<tr>
<td>Orientation</td>
<td>The part of a narrative that identifies the (initial) spatiotemporal situation in which the events recounted took place.</td>
</tr>
<tr>
<td>Beginning</td>
<td>The incident initiating the process of change in a plot of action.</td>
</tr>
<tr>
<td>Complicating Action</td>
<td>The part of a narrative that defines it as such; the complicating action follows the orientation and leads to the result or resolution.</td>
</tr>
<tr>
<td>Evaluation</td>
<td>The set of features in a narrative that indicate or suggest its point; the aspects of a narrative that show why the situations and events are worth narrating.</td>
</tr>
<tr>
<td>Result</td>
<td>The outcome of the events constituting the complicating action; the end.</td>
</tr>
<tr>
<td>Coda</td>
<td>A statement indicating that a narrative is over.</td>
</tr>
</tbody>
</table>

* Elements adapted from Labov (1972), with definitions from Prince (2003).

The essential part of a story grammar is the complicating action. The emphasis in narrative analysis is on action and agency rather than structural analysis or static variables (Franzosi, 2004). Ochs and Capps (1996: 26-27) note that, parallel to linguistic grammars, there are story grammars used by psychologists and literary theorists, among others, with varying terms used for the concept of complicating action: “Narratives of personal experience display a discursive syntax or story grammar that binds narrative. While linguistic, psychological, and literary treatments of narrative identify somewhat different narrative elements, they all stress that narratives of personal experience characteristically revolve around an unexpected or troubling turn of events … [r]eferred to as the complication, complicating action, trouble, the
inciting event, the initiating event, or the problematic event.” In Franzosi’s terms, this is the consequential event.

Regarding the analysis of expression or discourse, John Creswell (1998: 204-206) presents some advice on writing humanistic, interpretive biography that can be applied to narrative analysis: “The meanings of these experiences are best given by the persons who experience them; thus, a preoccupation with method, validity, reliability, generalizability, and theoretical relevance of the biographical method must be set aside in favor of a concern for meaning and interpretation ... Students of the biographical method must learn how to use the strategies and techniques of literary interpretation and criticism.” Creswell notes criteria for judging the quality of narrative analysis in the form of biography: “The research [should] illuminate the phenomenon in a thickly contextualized manner so as to reveal the historical, processual, and interactional features of the experience.”

**DATA ANALYSIS AND INTERPRETATION PROCEDURES**

*Data Preparation and Management*

The data were prepared for analysis using the qualitative data analysis software QSR N6. All email messages, student journal entries, wiki pages, wiki page comments, sets of student weekly module questions, research proposals, final reports, and interview transcripts were input as separately numbered documents. Chat transcripts and notes of face-to-face class meetings were not input into the QSR database and were managed separately using the Microsoft Excel and Word programs. Approximately 700 QSR documents (separate text entries) were created, ranging in length from several sentences in an email message to over 12,000 words in one of the final papers.

To aid in organizing and accessing the data, the documents were coded by data type, creator, sender or recipient, date, episode, broad mutually exclusive categories, and module or episode. Categories for data type were: (1) LIS 699 course email, (2) telementoring email sent by the participant to her high school mentee or the high school librarian, (3) chats, (4) journals, (5) module work, (6) research proposal, and (7) final paper. The broad, mutually exclusive categories were: (1) course business, (2) action research, (3) research project, (4) telementoring, and (5) personal (see Chart 10).
Chart 10. Categories of Course Communication Content

<table>
<thead>
<tr>
<th>Category</th>
<th>Communication Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Course Business</td>
<td>Procedural aspects such as scheduling, how to use the online tools, and clarification of assignments</td>
</tr>
<tr>
<td>2 Action Research</td>
<td>General topics such as impartiality, objectivity, claims and warrants, and ethics not specifically applied to the student’s action research project</td>
</tr>
<tr>
<td>3 Research Project</td>
<td>Issues related specifically to the student’s research project</td>
</tr>
<tr>
<td>4 Telementoring</td>
<td>Correspondence related to the high school telementoring activity</td>
</tr>
<tr>
<td>5 Personal</td>
<td>Sharing personal activities outside the course</td>
</tr>
</tbody>
</table>

While categories 2-4 sometimes overlapped, the coded data were reviewed several times to ensure that coding was consistent across participants. The software was used to group and regroup categories through Boolean set searches, as well as text searches for specific words or phrases. The software provides summaries of text volume in numbers of text units. Each text unit consists of approximately ten words. In the tables and figures reporting volume of student activity in Chapters 5, 6, and 7, word counts are estimated using the formula of ten words per text unit.

An early attempt was made to use grounded theory coding. Data coding and memoing were done manually and using the QSR software. In addition, a wiki site was created to organize the data around potential themes, to brainstorm ideas, and to write drafts. The process of grounded theory coding (Strauss and Corbin, 1998) requires open coding to identify concepts and categories; axial coding to relate categories to their subcategories; selective coding to integrate and refine the theory; coding for process that includes sequences of evolving action/interaction pertaining to a phenomenon as they evolve over time; and theoretical sampling of data driven by the evolving theory to discover variations among concepts and to densify categories in terms of their properties and dimensions. Open coding was started but not completed. However, the coding process was useful for helping me see the data in different ways, leading to the use of narrative analysis (as discussed above).

From the computer server logs, a course calendar was created to provide a chronological record of chat sessions and class meeting dates, assignment due dates, special events, and days the wiki was accessed by each participant and for what activity. Participant output in numbers of QSR text units was calculated by
data type, broad category, and module or episode. This allowed me to get a general overview of course activity and make preliminary comparisons of student activity and student-instructor interaction.

**Analysis of Primary Learning Narratives**

My first two research questions focused on discovering the key cognitive, affective, and interactional elements of the online conversations and the effect of student-instructor interactions on student understanding in the action research course. The objectives of the course were that students increase their understanding of and self-efficacy in action research. I constructed primary learning narratives focused on determining whether the learning objectives were met in order to help answer both research questions.

Though Labov developed his six elements of narrative as a result of linguistic analysis of a dialect of English, I considered these to be useful elements to construct a story grammar of learning in the course. The case reports in Chapters 5 and 6 are structured as primary narratives in a form adapted from Labov, as shown in Chart 11. The narrative element, “Beginning,” is taken from Aristotle’s *Poetics*.

<table>
<thead>
<tr>
<th>Narrative Element</th>
<th>Course Primary Narrative Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>Prologue, a brief description of the chapter</td>
</tr>
<tr>
<td>Orientation</td>
<td>Background</td>
</tr>
<tr>
<td>Beginning</td>
<td>Learning Action Research</td>
</tr>
<tr>
<td>Complicating Action</td>
<td>Planning and Conducting Research</td>
</tr>
<tr>
<td>Result</td>
<td>Final Paper</td>
</tr>
<tr>
<td>Evaluation (by student)</td>
<td>Final Course Comments</td>
</tr>
<tr>
<td>Evaluation (by researcher)</td>
<td>Research Case Analysis</td>
</tr>
<tr>
<td>Coda</td>
<td>Epilogue, a final statement that completes the design of the individually and socially constructed learning narratives</td>
</tr>
</tbody>
</table>

Each student chapter begins with a Prologue that presents a brief summary of the key themes and issues in the primary narratives and the most significant student sub-narratives. This is followed by a Background section that orients readers to six important personal factors assumed to affect the students’ online learning of action research and its application to their telementoring of the high school students: (1) Teaching Philosophy and Experience, (2) Research Experience, (3) Telementoring Experience, (4) Mentoring Experience, (5) Online Learning Experience, and (6) Relationship with Instructor. Data for this section were derived from the pre-course interviews and student final papers.

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The next section, Learning Action Research, discusses student learning of core concepts: (1) Awareness and Reflection, (2) Impartiality and Insider Research, (3) Validity, and (4) Claims and Warrants. I reasoned that learning these concepts initiated the process of change in the plot of learning about action research. The data for this section were selected mainly from the students' module work, i.e., the weekly writings in response to pre-discussion questions that were posted by the instructor. These provided student answers to the same questions at the same time. Modules 1-4, 8, and 10-14 were the primary sources. (See Chart 13 in Chapter 4 for a list of all modules.) Although I did not do a concept-by-concept comparison of the students' understanding of action research for the reasons stated above, the use of the same story grammar for both student chapters will allow such a comparison to be made by readers who wish to do so.

To identify the complicating action and the result or resolution in the primary narratives, I assessed which events made the greatest contribution to the students' understanding and use of action research. I examined student self-reports, particularly at the end of the course, i.e., module writings, journal entries, email messages, chat transcripts, final papers, and final course comments. Not surprisingly, in both cases it was conducting the research project that made the greatest impact on achieving the course objectives. The research projects gave rise to the students' most significant learning sub-narratives, as discussed in the next section of this chapter. Like concentric circles, the central point of the larger and smaller narratives consisted of the same consequential events. However, these events were unique to each student. Because the sub-narratives were unique, the primary narratives were also unique.

The section, Planning and Conducting Research, addresses three challenging aspects that both students dealt with as they completed their research projects: (1) Telementoring a High School Student, (2) Focusing the Research Question, and (3) Emotional Challenges and Learning Support. Data for this section were derived primarily from email exchanges, journals with subsequent commentary, and wiki pages with commentary from Modules 5-7 and 9, which were specifically related to the students' research projects.

The section, Final Paper, describes the outcome of the complicating action: the students' understanding and application of action research. The final papers were the fullest representations of the result element in the primary narrative and were themselves narratives. Though each student paper was
organized in a standard report format, the narrative elements were strongly evident. The papers told stories about doing research, reaching new understandings, and undergoing self-change in the students' own words.

Evaluation is the part of the primary narrative that indicates its importance in relation to achieving the course objectives. The section, Final Course Comments, presents the student's evaluation of six aspects of the learning experience: (1) Ranking of Course Components, (2) Most Important Learning, (3) Learning from Readings and Modules, (4) Telementoring, (5) Online Communication and Learning, and (6) Instructor. These comments, elicited through a written questionnaire and an oral interview, were vital in identifying plot elements and interpreting meaning in discourse. The section, Research Case Analysis, presents discussions of six aspects of the researcher's evaluation of the significance of the learning narratives: (1) Statistical Summary of Course Activity, (2) Most Significant Learning Sub-narrative, (3) Self-Scaffolding in Reflection, (4) Affective Dimension, (5) Co-Reflection and Co-Construction of Knowledge, and (6) Role of Online Media in Communication and Learning. Finally, the Epilogue reiterates the most important themes and issues in the construction and co-construction of knowledge and meaning in the primary narratives.

The primary narrative that spanned the students' experiences during a one-semester course represented the students' learning in the most general and abstract terms. Each of the three main sections above—Learning Action Research, Planning and Conducting Research, and Final Paper—also included numerous sub-narratives.

**Analysis of the Most Significant Individual Sub-Narratives**

The need to construct sub-narratives of the students' most significant learning related to their action research projects emerged from scrutinizing the data and realizing that the primary narratives depended on these unique student sub-narratives, i.e., understanding action research came most effectively through the practice of it. This conclusion seems almost too obvious to need stating. Experiential learning has been seen as the heart of effective learning by many modern educationists since Dewey (1916), although the idea of praxis derives from Aristotle. The value of enlarging understanding through experience and practice is the belief of innumerable proponents of constructivism in education, perhaps most notably David Kolb.
(1984) at the level of adult learning. This is also the basis for Wells' concept of understanding being embedded in action.

The individual research projects gave rise to the students' most significant learning sub-narratives, and their final papers were the most cohesive and comprehensive articulation of these stories. The complicating action for each sub-narrative was being confronted with a challenging question or situation. In order to examine in detail how each student resolved the issue through individual and collaborative reflection, I referred to key ideas in the literature on reflection and reflective practice. Returning to the literature to seek guidance from those more experienced in studying reflection than myself was a pragmatic decision. It may be the case that doing this led me to view the data in a distorted way or curtailed some creative thoughts that might have arisen without such guidance. This reinforces for me one of the major challenges of doing an interdisciplinary study such as this case study. A single researcher is limited in her mastery of relevant subject areas. Such studies might be better served by a team of researchers with expertise in different disciplines and research approaches. Norman Denzin (1978; as noted in Janesick, 2000: 391) has identified various types of triangulation – data triangulation, investigator triangulation, theory triangulation, and methodological triangulation. More recently, Johnson and Onweugbuzie (2004) have proposed that educational research will move beyond quantitative versus qualitative research ideas and value mixed methods research. They propose that pragmatism is the philosophical partner for mixed methods research. In this sense, my pragmatic approach might be seen as a similar effort to use induction, deduction, and abduction, described by Johnson and Onweugbuzie as “uncovering and relying on the best of a set of explanations for understanding one’s results” (ibid., p. 17).

Since its appearance in 1910, Dewey's influential book, *How We Think*, has been the basis for much of the work on reflection. He states that there are five distinct steps in reflection: “(1) a felt difficulty; (2) its location and definition; (3) suggestion of possible solutions; (4) development by reasoning of the bearings of the suggestion; and (5) further observation and experiment leading to its acceptance or rejection; that is, the conclusion of belief or disbelief” (ibid., p. 72). Dewey discusses the importance of the concrete and the abstract in thinking and states “a leap is involved in all thinking” (ibid., p. 26). He does not acknowledge the importance of affect.
Boud et al. (1985a) introduced a model of reflection that was among the first to integrate the affective dimension. They define reflection as the “intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations” (ibid., p.19). The three stages of their model are: (1) returning to experience – observations of behavior, feelings, and ideas that occurred at the time; (2) attending to feelings – utilizing positive feelings or removing obstructing feelings; and (3) re-evaluating experience – making new associations, integrating thoughts and feelings, validation of new perceptions, and appropriation into the reflector's value system. Schon (1983) presents a view of reflection (reflection-in-action, reflection-on-action) as a process of professionals creatively responding to the problems of practice that is both experiential and social.

Based on a synthesis of these ideas, I developed a plot structure for the sub-narratives consisting of seven key features: (1) being confronted with a challenging question or situation, (2) dealing with feelings/emotions related to the challenge, (3) bringing experience into the thinking/reflecting process, (4) reframing perspective through bridging the concrete and the abstract, (5) making a leap of thinking, (6) integrating the new knowledge cognitively and affectively, (7) with implications for future action. Steps 2 and 3 may occur simultaneously or in reverse order. Using these as elements in a special story grammar for the reflection process, I analyzed how the students responded to the consequential events in their sub-narratives. In both cases, the problematic situation initiated a transformational learning experience that led to new understandings related to their research questions and higher self-efficacy in some important action research skills.14

The events associated with the story grammar of the sub-narratives were identified based on student self-reports. The key texts were derived from the final papers and supported with data from other course material and the final course comments. I did detailed semantic analyses of the texts that were most revealing about the consequential events and the resolution of the problem or issue identified. The analyses of the sub-narratives are discussed in the Research Case Analysis sections of the respective student

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14 It should be noted that not all these features are used in every act of reflection, but those acts in which more features are evident generally lead to deeper learning transformations. In commenting on the three stages of their model of reflection – returning to experience, attending to feelings, and reevaluating experience – Boud et al. (1985a: 26) note that “the third stage of reevaluating the experience which, although it is the most important, is often not completed if the previous two are omitted.”
chapters. Each discussion identifies the theme of the sub-narrative, presents related background issues, discusses one or more consequential events, and provides an explanation of how the student used the seven key features of reflection to reach a resolution.

To reiterate, the primary learning narrative was derived from the goal of the course: to learn about action research. Within each primary learning narrative, the most significant student learning sub-narrative was identified from student self-reports about consequential events and changes in frames of reference. A plot structure of a sub-narrative consisting of the seven key features of reflection was used to show how the transformational learning experiences led to learning outcomes. The selection of plot elements and interpretation of discourse in the primary narratives and most significant sub-narratives relied on the researcher's judgment but was verified by the students.

The complicating action of the primary narrative (Planning and Conducting Research) is explained through the use of a sub-narrative based on reflection. The complicating action within the sub-narrative is a leap of thinking. Through identifying the complicating actions, key student learning outcomes were identified, as shown in Figure 4.

![Figure 4. Primary and Sub-Narrative Relationship](image)

The story grammar of the sub-narratives serves three purposes. First, it provides a typology of the steps in the reflection processes of adult learners that recognizes the importance of affect. Second, it provides the basis for identifying and elaborating upon the processes of transformational learning initiated by consequential events and leading to increased understanding and higher self-efficacy. Third, it provides
evidence for acknowledging and accommodating learning differences through a focus on the learning that is most valued by the students themselves within the learning framework and course objectives.

**Analysis of Sub-Narratives of Co-Reflection**

The three research questions addressed interaction through different approaches – the first to identify the types of interactions that occurred, the second to determine how such interactions affected student understanding in the course, and the third to determine how they affected instructor learning as indicated by course development. The underlying factor to be examined through these approaches was the co-construction of knowledge.

As will be discussed in Chapters 5 and 6, knowledge was co-constructed in the student-instructor dyads based on collaborative meaning making accomplished through co-reflection. As part of the discussion of findings in Chapter 7, I discuss in detail the definition and features of co-reflection that I arrived at as a result of the analysis and interpretation of the data. Briefly, co-reflection is a collaboratively undertaken reflective process. Boud et al. (1985a: 19) define reflection as the “intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations.” Building upon this definition, co-reflection is defined as the “intellectual and affective activities in which two or more individuals collaboratively engage to explore their experiences in order to lead to new intersubjective understandings and appreciations.” The co-construction of knowledge involves co-reflection and results in knowledge that is the cumulative result of communication and learning interactions. Co-reflection uses some or all of the seven key features of reflection and therefore has the potential to provide significant learning sub-narratives.

I use the term co-reflection to indicate the process of dialogic inquiry – building knowledge and understanding through inquiry-based interactions – at a higher level of intellectual and emotional maturity than the K-12 educational context used by Gordon Wells. Wells assumes rightly that in this context, dialogic inquiry focuses on student learning: “Teaching … involves the ongoing co-construction of each student’s zpd [zone of proximal development] and on-the-spot judgments [by the teacher] about how best to facilitate his or her learning in the specific activity setting in which he or she is engaged” (1999: 129). In “teaching” adults, learning and teaching are two-way streets.
A third type of narrative – a co-reflection sub-narrative – was also identified. The co-reflection sub-narrative is based on the seven key elements of reflection but also exhibits four interactional characteristics: (1) sharing of experience and relevant information; (2) achievement of intersubjective understanding through collaborative meaning making; (3) synergy between relationship building and co-reflection based on respect, trust, sincerity, and concern; and (4) teacher as co-learner (see Figure 5).

Figure 5. Reflection and Interaction in the Co-Reflection Process

<table>
<thead>
<tr>
<th>CO-LEARNER REFLECTION</th>
<th>INTERACTION</th>
<th>CO-LEARNER REFLECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Confronted with a challenge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Dealing with feelings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Returning to experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Reframing perspective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• A leap of thinking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Integrating new knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Implications for action</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sharing experience &amp; information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Intersubjective understanding through collaborative meaning making</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Synergy of co-reflection &amp; relationship building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Teacher as co-learner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Confronted with a challenge</td>
<td></td>
<td></td>
</tr>
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<tr>
<td>• Returning to experience</td>
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<td>• Reframing perspective</td>
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<td>• A leap of thinking</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>• Implications for action</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The efficacy of co-reflection rests tacitly on elements necessary for reaching intersubjective understanding that have been identified by Habermas in his theory of communicative action. According to Habermas (1984: 99), in order for discourse to be effective and for intersubjective understanding to be achieved, each speaker makes statements that are valid because they are true, right according to mutually held values, and sincere. Co-reflection based on truth, rightness, and sincerity is necessary for understanding, efficacious for learning, and deeply rooted in democratic values.

In each student chapter, significant co-reflection sub-narratives are discussed in the Co-Reflection and Co-Construction of Knowledge section of the Research Case Analysis. I identify the theme of the sub-narrative, present related background issues, discuss one or more consequential events, provide an explanation of how the dyad used the seven key features of reflection to reach a resolution, and show the existence of the four interactional characteristics of co-reflection.
NARRATIVE ANALYSIS: EFFECTIVE MEANS OF EXAMINING LEARNING

Narrative analysis has the advantage of being a theoretically coherent, logical means of studying learning that is matched to the nature of learning itself. (See Chapter 7 for a discussion of how the Dialogic Inquiry Model in Figure 3 above was revised as a narrative learning model). Learning is a complex, multidimensional process shaped by individual uniqueness and social context. Narrative analysis does not shun complexity and uniqueness but rather embraces them. The art of narrative analysis in producing works of significance and utility is reduction appropriate for particular audiences.

Through a demonstration of the use of narrative analysis that allows a clear focus on human agency, this study makes a contribution to the CSCL multi-method research agenda. This study uses narrative analysis to understand, explicate, and evaluate individually and socially constructed knowledge in conjunction with a narrative learning model. Subsequent chapters will show that key learning outcomes can be identified through the use of primary narratives and significant learning sub-narratives.

Narrative analysis can contribute to theory building about the nature of individual and group cognition. Narrative analysis enables researchers as well as instructors to analyze small changes in narrative situation at the level of event, as well as larger changes in frames of reference at the levels of a learning episode or an entire course. The benefit of narrative analysis is that, at each level, learning is seen as a plot – a unitary, multidimensional, dynamic phenomenon focused on changes in states of understanding. Affective, cognitive, interactional, and transformational dimensions are viewed as integrated and inseparable in the learning process. Because co-reflection is a process of collaborative meaning making, it is clear that the frames of reference all learners (students and instructors) bring to the process are the essential building blocks for the creation of meaning. Frames of reference are best apprehended as they appear in participant self-reports.

As a meaning-making tool, narratives are necessarily selective and subjective. The two graduate students used course resources differently to produce their assignments, projects, and final reports. The fact that narratives are selective and subjective is in fact their strength: this leads to greater internal validity. A narrative is not the whole story. The narratives of Ruth and Sarah do not capture all the influences on their learning nor the complete story of the learning itself, but rather identify key elements within the course
framework. Because the narratives were interpreted by the researcher based on student self-reports (presumably sincere), they are assumed to be reasonably accurate representations of the learning motivations, intentions, and outcomes valued by the students. As data, narratives are closer to lived experience than respondents’ answers to open-ended interview questions, surveys, or end-of-course evaluations. The value of examining individual narratives of the learning experience is the potential for understanding the complex means by which discovery learning occurs.

As researcher, I interpreted the students’ discourse to determine the plots for their narratives. My stance as a full participant-observer had advantages and disadvantages, discussed later in this chapter. I addressed the competing claims of objectivity and subjectivity through methodological and data triangulation, consulting the participants and other researchers, iteratively scrutinizing the data to confirm or disconfirm findings, and returning to the literature throughout the analysis and interpretation process to ensure reasonable objectivity while benefiting from the insights that often come with empathy and commitment. Lofland and Lofland (1995: 55) note that “most fieldworkers adopt a stance that is somewhere in the middle of the continuum: trust combined with a heady dose of skepticism; suspicion mixed in with large portions of faith.”

Narrative analysis offers features that complement other discourse analysis methods such as speech act theory, grounded theory, content analysis, and conversation analysis. Narrative analysts can use both text and talk to apprehend a holistic view of learning that focuses on change and agency. This allows analysts to perceive the construction and co-construction of knowledge at the levels of event, episode, or longer processes over time. It lends itself to longitudinal case studies that can contribute to theory building and complement experimental studies and quantitative case studies. It also has the advantage of clarity and meaningfulness in the presentation of research results, an important issue for communicating with practitioners and policymakers.

Narrative analysis also supports a practical, action orientation to research results. The presentation of findings can be multilayered narratives, or narratives using different genres, making the findings accessible to a wide range of readers, beginning with the participants themselves, to practitioners, researchers, policymakers, and social theorists. The products of narrative analysis can illuminate understanding of a
phenomenon, serve as a guide for future action, be the basis for policy recommendations, and provide opportunities for the users of the findings to learn or develop new capacities and experience a sense of empowerment. They can raise value-based or ethical concerns in the context of the stories of human lives. Combined with the narrative form as a pedagogical guide, research using narrative analysis provides a powerful basis for research that can convey clear and meaningful results to practitioners and policymakers.

SCOPE AND LIMITATIONS OF THE STUDY

The purpose of the study was to examine how affect and interaction influence participant understanding of action research. My reasons for undertaking this study were theoretical and pedagogical. As researcher, I wanted to investigate similarities and differences in learning by the two students – who were exposed to the same course content, presentation, and assignments – in order to contribute to theoretical and research knowledge about the co-construction of knowledge in online learning environments. As instructor, I wanted to understand the students’ learning experiences to help improve my future practice. As instructor and researcher, it was important to me to value and honor the students as individually unique learners.

The study population consists of two students and one instructor, all female. The study took place in the unique cultural and educational setting of Hawai‘i and the University of Hawai‘i Library and Information Science (LIS) Program. I have fully described the characteristics of the participants, setting, course, and processes to permit adequate comparisons with other situations.

This study, like ethnographic case studies in education in general, aims to achieve a deep understanding that recognizes that learning is influenced by a complex array of factors that can be combined uniquely in different classrooms or learning contexts, or in the same classroom at different times. These factors include learning styles; individual knowledge, skills, feelings, experience, and motivation; domain content, structures, and processes; teaching styles; and context, as well as happy (or unhappy) accidents that occur as the learning proceeds. The strengths of this study are the rich details that may provide a sense of recognition for some and a sense of clear possibility for others.

While the communication strategies and patterns were clearly different among the participants, gender may have played a role in encouraging some communication patterns sometimes associated with women, such as the expression of empathy and a collaborative rather than argumentative approach to negotiating
meaning. One of the benefits of this study may be an illumination of the influence of women's ways of knowing in an all-female online course. On the other hand, more diverse communication strategies might have been more clearly seen in a mixed gender study.

There is also the issue of a power imbalance between instructors and students. As the instructor, I was in the position of giving the final grades for the course. From February 25, 2004, when the students gave me permission to use the course data as part of my research, the students were also aware that their words would be studied, so they may not have been completely honest or spontaneous. They might have expressed what they believed that I, as the instructor/researcher, wanted to hear. They may also have performed exceptionally well because they knew they were being observed (the Hawthorne effect).

As Hine (2000) has noted, virtual ethnography is necessarily partial. Many clues to understanding, such as nonverbal cues, are not available. The advantage of using computer logs to capture data is that participant expressions are recorded exactly, so there is no fear of oral communication being transcribed improperly. However, because online communication cannot convey the fullness of meaning of face-to-face communication, there is a need to read between the lines and a great number of alternative readings to choose from. The researcher must admit a number of possible explanations, or avoid explanation altogether.

However, as Hine also notes, virtual ethnography involves intensive engagement with mediated interaction. The shaping of the interactions between the students and myself by the technology has been an important element of this case study. I believe my engagement with the medium has been a valuable source of insight, and I have shared these insights in the writing of this report.

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15 The women's ways of knowing (WWK) paradigm (Belenky, et al., 1986) identifies the use of empathy and caring as aspects of several distinctly female epistemological stances. The study from which this paradigm emerged was conducted in response to William Perry's (1970) scheme of intellectual and ethical development based on interviews of male students at Harvard University. There is an ongoing debate over the validity and accuracy of these two views of epistemological development (e.g., Baron, 2003; Goldberger, et al. 1996). Related to online communication, Jenny Preece (2000: 126-172) notes that research has shown that "women tend to be oriented more toward connectedness and relationships [than men], showing greater empathy and sensitivity to the emotions and feelings of others" and that "gender differences in conversational style have been observed to transfer to online textual communication."
ENSURING RIGOR AND RELEVANCE

The primary challenge in participant research is overcoming researcher subjectivity and bias in the selection and analysis of the data. Miles and Huberman (1994: 278-280) offer criteria for rigor and relevance that have been applied to the study and this report of its findings: (1) reasonable freedom from bias (i.e., objectivity); (2) dependability (i.e., reliability); (3) credibility or authenticity (i.e., internal validity); (4) transferability (i.e., external validity); and (5) utilization, application, or action orientation.

To ensure that the reader has reasonable freedom from my biases, I have explicitly described my general methods and procedures; described how data were collected, coded, and conceptualized; linked my conclusions with exhibits of data; provided a record of the study’s methods and procedures to serve as an “audit trail”; aimed to be as explicit and as self-aware as possible about my personal assumptions, values, biases, and affective states, and how they may have come into play during the study; considered competing hypotheses or rival conclusions; and retained study data and made them available for reanalysis by others, without violating obligations for confidentiality.

To ensure dependability and consistency, I have presented clear research questions, congruent with the case study design; described my role and status within the site; observed whether findings show meaningful parallelism across data sources; specified basic paradigms and analytic constructs, with the aim of connecting to theory; used the computer to consistently and comprehensively collect data throughout the course for both students; done coding checks to ensure that codes show adequate agreement; and utilized peer and participant review.

To ensure credibility and authenticity, I have used triangulation among complementary methods and data sources to aim for generally converging conclusions; linked data to the categories of prior or emerging theory; tried to ensure that the findings are internally coherent and the concepts are systematically related; made explicit the rules used for confirmation of propositions, hypotheses, etc.; identified areas of uncertainty; sought negative evidence and explanations; considered rival explanations; asked participants to check conclusions for accuracy; and attempted to describe the accuracy of any predictions made.

To assist in transferability to other contexts, I have fully described the characteristics of the participants, settings, and processes to permit adequate comparisons with other studies; discussed the
limiting effects of population, setting, history, and constructs used; defined the scope and the boundaries of reasonable generalization from the study; connected findings with the experiences of other settings or situations; connected the findings with prior theory; preserved the narrative sequences unobscured; and suggested settings where the findings could be fruitfully tested further.

To assist in utilization of the study’s findings, I have aimed to make the findings intellectually and physically accessible to potential users; stimulated “working hypotheses” as guidance for future action; aimed to offer usable knowledge in the form of understanding of the phenomenon, action recommendations, and broader considerations; aimed for the users of the findings to experience a sense of empowerment; aimed for the users of the findings to learn or develop new capacities; and raised value-based or ethical concerns.

Selectivity and subjectivity are not necessarily detriments to research. Other forms of analysis also require the researcher to select what is to be studied and how data is to be collected, analyzed, and interpreted. Some qualitative researchers (Merriam, 2001: 203) argue that, when the researcher is the data collection instrument, internal validity is actually stronger than in quantitative research:

- Reality, according to Lincoln and Guba (1985), is “a multiple set of mental constructions … made by humans; their constructions are on their minds, and they are, in the main, accessible to the humans who make them” (p. 295). And because human beings are the primary instrument of data collection and analysis in qualitative research, interpretations of reality are accessed directly through their observations and interviews. We are thus “closer” to reality than if a data collection instrument had been interjected between us and the participants. Most agree that when reality is viewed in this manner, internal validity is a definite strength of qualitative research. In this type of research it is important to understand the perspective of those involved in the phenomenon of interest, to uncover the complexity of human behavior in a contextual framework, and to present a holistic interpretation of what is happening.

**MY ROLE AS RESEARCHER**

As researcher, I was a full participant-observer. The advantage of using my own teaching practice as the raw material is the intimate knowledge I have about the context, participants, and processes involved. As instructor, I was highly motivated to understand how my students learned, to innovate and adapt my teaching for the online environment, and to delve more deeply into the meaning of virtual teaching through experiencing it. In this report, I have referred to both roles using first person (e.g., “as instructor/researcher, I …”) and third person (i.e., “the instructor” or “the researcher”).
I maintained a researcher's journal, as noted above. Throughout the course, I also kept an instructor's journal for preparation and follow-up to course activities. My core questions were: (1) How well do I understand my students as learners and co-learners? (2) How effective are the course readings and assignments at helping the students grasp the core concepts of action research? (3) How structured or flexible should the course be? (4) How effective am I as an instructor and mentor at facilitating the learning about action research by the students? (5) How effectively are we using the technology to enhance learning?

Chapter 4 presents the instructor's perspective of the course evolution. I have also included my reflections as instructor throughout the chapters discussing the findings, which involves the comparison of discrete pieces of evidence as well as holistic narratives aimed at promoting depth of understanding of participant experiences. Reflexivity is an important tool I used to help make the study meaningful and relevant. I have aimed to be truthful and accurate. I believe the inclusion of my reflections, thoughts, and feelings helps give depth, fullness, and credibility to the report and provides insights for other practitioners.

The kind of intimacy that comes with an insider's stance has its advantages and disadvantages. Being an insider, one is able to: (1) start where one is, with a high degree of motivation; (2) formulate highly relevant research questions; (3) gain easier access to settings and participants; (4) understand many aspects more fully and deeply than a stranger to the setting could in the same amount of time; and (5) present findings in a way that is understandable and relevant to the participants in a particular setting. As a practitioner researcher, I was able to devote valuable time, effort, and thought to examining student learning and my own practice that I had been unable to afford until this opportunity. The experience has been humbling, emotionally and intellectually satisfying, and empowering.

The disadvantages of insider research include: (1) blindness to aspects of the setting and participants that could be more easily seen by a detached observer; (2) bias that causes the researcher to take sides in conflicts of interest among participants; (3) ethical issues of trust, possible deception, and how much can be revealed without harming others; (4) personal issues and emotional stress related to sustaining personal

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16 As a number of authors in Denzin and Lincoln's (2000) *Handbook of Qualitative Research* show, the use of reflexivity is recognized as an important aspect of many types of qualitative research methods such as case study, grounded theory, cultural studies, autoethnography, participatory action research, cultural studies, and program evaluation.
relationships vs. achieving research goals; and (5) power issues in the relationship between researcher and participants.

Being an insider researcher, I occasionally faced challenging situations, discomforting emotions, and difficult choices. With the exception of the high school students, all the participants in this study were members of the same relatively close-knit professional community. The major challenges stemmed from my competing values and standards as a researcher, professional standards as an educator and librarian, and communal values toward a group of professionals and individuals within that group for whom I have a great deal of respect and affection. This caused internal conflicts as well as the possibility of conflicts with other participants. In addition, because of my role as a researcher, I had privileged knowledge about the participants and their views of each other that my communal values prevented me from sharing, despite the fact that more openness might have furthered my pedagogical or research goals.

I endeavored not to impose my research goals or professional judgments on others and generally chose to observe events as they unfolded. While it was uncomfortable to silently observe behavior that seemed to conflict with my standards or research goals, forbearance allowed me to realize that understanding and empathy, not judgments, were more appropriate. I found that I was enacting Mezirow’s transformative learning theory by intentionally working to “transform [my] taken-for-granted frames of reference … to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action.”

While I have tried in this report to include all relevant data and to be as transparent as possible in the reporting, I have also been conscious of my ethical responsibilities as a researcher to avoid harm to participants and my professional obligations to fellow educators and librarians, who will remain vital, active, contributing members of collaborations to improve conditions for Hawai‘i’s students as this dissertation gathers dust. In selecting the data to be analyzed for this study, I avoided reporting incidents and conversations that I deemed might have negative repercussions for the participants. While some interesting and potentially valuable narratives remain only with me, I believe that the most important
findings of this research are well supported by the data that has been included and would not be altered by the data that has been excluded.

I tried to maintain an optimal balance of objectivity and subjectivity through the use of critical thinking, detachment, and logical argumentation while also drawing insights from empathy and commitment. These two different observer stances correspond with two of the epistemological stances of the women’s ways of knowing model. Separate knowing recognizes the positive role of logic, analysis, and debate. It “aims for accuracy, precision; modulates voice to fit standards of logic or discipline ... suspicious of unexamined subjective knowledge” (Stanton, 1996: 31). On the other hand, connected knowing operates through trust, empathy, and relationship: “Connected Knowing provides another set of procedures for testing ideas, but takes a radically different stance. People who take this approach play the believing game ... The more Connected Knowers disagree with another person the harder they will try to understand how that person could imagine such a thing, using empathy, imagination, and storytelling as tools for entering into another’s frame of mind” (Belenky and Stanton, 2000: 87-88). I used both separate and connected knowing with the aim of providing an account that is truthful, honest, accurate, and empowering for myself, the study’s participants, and other researchers and educators.

Because the researcher is the primary instrument in qualitative research, allowing others to know what this instrument consists of is an intellectual and ethical obligation. I feel it is my obligation to make clear what aspects of self, experience, personal history, and worldview have most directly affected the shaping of this research project and its final products. I see the research process as a continual dialogue among researcher, setting, theoretical frameworks, participants, methodologies, and other minds yet to be present. I have been engaged in a complex, delicate balancing act throughout the research and writing process. As subsequent chapters document, my original stance has been changed, refined, and deepened as this conversation has progressed. As far as is practical and relevant, I have articulated these ongoing changes in the research report.
HUMAN SUBJECTS APPROVAL

Approval (IRB certification) for the original study design was obtained from the Committee on Human Studies, University of Hawai‘i at Mānoa on July 21, 2003. Approval for the revised study design was obtained from the Committee on Human Studies on March 16, 2004.
CHAPTER 4. GRADUATE COURSE IN ACTION RESEARCH

INTRODUCTION

Beginning in January 2004, I facilitated a one-semester, guided action research course (LIS 699) with two graduate students in the University of Hawai‘i Library and Information Sciences program. At the same time, these graduate students were telementoring two high school students as they worked on their senior research projects. My aim was to give the graduate students an opportunity to learn about action research through a field-based experience while assisting the high school students. Based on the graduate students’ request, the course was conducted primarily online. The action research course and the telementoring project were based on similar theoretical and pedagogical principles: the nature of learning as dialogic inquiry and the importance of the affective in learning (see Chapter 2, Figure 2). Both the course and the telementoring project used websites based on the same software programs.

SETTING AND PARTICIPANTS

The Library and Information Science Program, University of Hawai‘i at Mānoa

The University of Hawai‘i is a multi-campus, statewide system of postsecondary education that includes three university campuses and seven community colleges. It offers course work leading to bachelor’s degrees in 89 programs, master’s degrees in 77, and doctorates in 43. Founded in 1965, the Library and Information Science (LIS) Program prepares professionals to work in libraries and other types of information-handling agencies. As the LIS program catalog notes, “the program seeks to transmit to its students an awareness of the rapidly changing world of library and information technologies in the 21st century, and the role of information in society ... [its] mission is to educate individuals for careers as librarians and information specialists and to undertake research and service programs that meet current and emerging library and information needs” (University of Hawai‘i, 2001: 1-2). With seven faculty members and over 15 adjunct faculty, it offers a Master of Library and Information Science degree, a Certificate in Advanced Library and Information Science, and is one of four programs cooperating to offer the interdisciplinary PhD in Communication and Information Sciences.
One of the areas of concentration is the School Library Media Specialist (SLMS) Certification. Students interested in becoming school library media specialists certified by the Hawai'i State Teachers Board must follow this track. Hawai'i's SLMS certification is one of the most demanding in the nation, requiring 42 credit hours for completion. The LIS Program works with the UH College of Education to comply with the National Council for Accreditation of Teacher Education guidelines. Those who enter the LIS Program to earn this certification must have completed a state-approved teacher education program recognized by the Hawai'i Department of Education. Most LIS students in this track have had some teaching experience before entering the program.

The Graduate Students

The two graduate students were LIS students in the SLMS track. Neither student had previously conducted any formal research. Brief introductions are presented here and developed more fully in Chapters 5 and 6.

Ruth

Ruth had been an elementary school teacher for the previous seven years, teaching second and sixth grades as well as music. Her degree specialization was science. She described her teaching as child-centered, emphasizing hands-on learning. She feels that it is important "for the kids to build relationships with each other, so there's a lot of cooperative group learning." Ruth had been using email for five years and had previously taken one class that was completely conducted online, which was not a satisfactory experience. When asked about her previous experiences with mentoring, Ruth mentioned with enthusiasm having recently been mentored by a practicing librarian, Lee (who was also the supervising librarian in the telementoring project). Ruth began mentoring Jessica, a high school senior, in January 2004. She had known Jessica previously and felt that this would be an advantage when using online communication.

Sarah

Sarah had been a public high school English teacher for nine years. She also served as the faculty advisor for various student activities and was involved in a number of professional activities at her school. Sarah described her teaching philosophy as evolving. She now enjoyed building her activities on student inquiry.

17 The names of participants and the participating high school are fictitious to preserve their anonymity.
but noted that this had required her to “open my thinking, go with what the kids wanted to do, even if it wasn’t what I wanted to do.” She “connects to the kids through stories” and aims to build an environment where everyone feels comfortable and safe. She wants to teach to individual students, but finds it difficult to accommodate all the different learning styles in the classroom. Sarah’s experience with online communication tools had been primarily using email. She had little previous experience with online learning. She had considerable mentoring experience and felt comfortable mentoring and being mentored.

**High School Telementoring Program**

The telementoring program had originally been the primary focus of my dissertation study, and it was the focus of the graduate students’ action research projects during the course. This program had been envisioned as an innovative way to support two high school students engaged in individual research projects under the guidance of a school library media specialist. The program began in September 2003 and ended in early June 2004. It was intended that the students would complete a personal education plan that encompassed post-graduation learning and career objectives, complete an internship with a career mentor of their choice, and do a year-long senior research project with a career focus.

The role of the school library media specialist was to determine the learning goals and assessment measures, ensure that the students met the goals and standards, and liaise with the mentors and the researcher regarding learning goals, assessment, and student progress. The role of the graduate student mentors was to assist the school library media specialist in helping the students use and improve their information literacy skills as they engaged in the research process. They also assisted in my original research through “providing” telementoring exchanges, journal entries, and interview data. My role was to offer the online workspace, provide technical support, recruit and support the mentors, and act as liaison between the school library media specialist and mentors when necessary. As has been discussed in Chapter 3, my original research was refocused on the action research course.

**The High School**

Central High School (grades 9-12) is an innovative new school located outside Honolulu on the island of O‘ahu. Established in 2000, it had its first senior class in the academic year 2003-2004. The educational aim of the school is to offer a challenging curriculum that offers individualized learning with a career
focus, grounded in inquiry-based, problem-based learning connected to the community so that real life
skills and connections can be established and maintained.

The curriculum is interdisciplinary, with teacher teams responsible for each class. In the 9th and 10th
grades, students work on team projects, complete core academic classes, and begin exploring career fields.
At the end of 10th grade, they choose an academy to focus their learning in the upper grades. The 11th and
12th grade academies are the Professional Science Academy, Communication and Art Academy, Learning
Center for Applied Technology, and Business Academy. The "purpose for the academies is not to train
students for specific careers (though they do gain useful career-related knowledge and skills), but to
provide a context for learning that empowers them to acquire academic content and apply it to real world
issues." ^18

At the time the telementoring project was being implemented, the school was considering an
important addition to the curriculum for the senior year: an individualized, year-long project with a career
focus that involves mentorship with a community member. The senior project requirements would be: (1)
to be connected to a focused program of study; (2) to involve an adult consultant from the community; and
(3) to conduct an experiment or other in-depth research, seek a solution to a problem, invent or design
something original, and/or make a contribution to society.

The High School Student Mentees

The high school students who were telementored by the LIS graduate students were both female members
of the high school's first senior class and were part of the same senior academy. They had been online for
five to seven years and were experienced using the internet, search engines, chatting, and emailing, among
others. They had also used online sources for doing research on school projects. Corel hoped to become a
manga/anime artist and a writer. During her senior year, she worked in a local public library as well as the
school library. She had no previous experience with mentoring, either as a mentee or a mentor. Jessica
aimed to become a sports broadcast journalist, entering the ranks of a small number of women in the field
in Hawai'i. She had experience being mentored in two "job shadowing" opportunities at a local television

^18 From the high school’s website.
station. She managed a number of school sports teams and was also the editor-in-chief of the school newspaper. She was an active and popular student.

The Supervising Librarian

The supervising librarian, Lee Suzuki, is a dynamic and very active member of the school team, involved in curriculum development and integrating information literacy skills into classroom work. She was a member of the task force that had planned the school. She actively works with students, faculty, and administration both inside the library and without. She was in charge of supervising the two students as they developed their future career plans and senior projects. She considered her work with the high school students and the telementoring project in the larger context of the school and used this opportunity to pilot the concept of the senior project for possible school-wide implementation.

LIS 699: DIRECTED READING/RESEARCH IN ACTION RESEARCH

Three areas were deemed most critical in designing an effective online action research course: (1) content appropriate for novice teacher researchers; (2) simple software that would allow novice users to easily create their own web pages and collaborate online; and (3) ways to facilitate online communication to maximize its advantages and minimize its deficiencies.

Technology

The technology used for creating the online course space was WikkiTikkiTavi\textsuperscript{19}, a wiki-style collaborative software program. Ward Cunningham, the originator of the wiki concept, calls it “the simplest online database that could possibly work” (Leuf and Cunningham, 2001: 15). Users can easily create web pages and link them to each other without coding in HTML, and everyone can edit every page, including text that others have written. This software was chosen based on the following assumptions: (1) students who create their own web pages as an integral part of the learning process are more likely to reflect and to sustain their motivation for learning in the virtual environment; (2) the products of the learning process should remain as a source of individual and community memory for shared learning and further reflection; (3) instructors should have the flexibility to adapt the website to evolving learner needs; (4) the flexibility of the software

\textsuperscript{19}See http://tavi.sourceforge.net/WikkiTikkiTavi
might encourage participants to adapt "offline" learning and communication strategies and patterns to the online environment; and (5) the participants might be able to use the software in their work as teachers and librarians. I had previously used a wiki to support collaborative work in a face-to-face class. Small groups used the wiki to keep records of their brainstorming and problem solving in class. Later, these ideas could be shared with and edited by other groups asynchronously. The wiki was also used to collaboratively construct quizzes.

Before it is filled with content, a typical wiki-style website begins with a single home page, such as the one shown in Figure 6. This template includes the page title at the top of the page ("WelcomePage") consisting of two or more capitalized words with no intervening spaces. A static menu below the page title provides links to the home page, a page with links to all pages on the website ("PageIndex"), a page listing recently edited pages in reverse chronological order, and a link to the login page ("Preferences"). While the content of any wiki page may be edited at any time, the bottom of the page includes a box for adding comments that cannot be edited after they are posted. All comments (with indication of page version) are retained in chronological order on each subsequent version of the page. There is also a link ("Edit this document") that takes the user to the edit mode of the page (see Figure 7), as well as a second link ("View document history") that allows one to view a history of all changes made to the page.

**Figure 6. Wiki Home Page Template**
One can create content on any new wiki page by simply typing text into the text box, in the page’s edit mode. This simplicity allows even novice users to quickly and easily create web pages and feel a sense of accomplishment. By using a few simple formatting rules using common keystrokes such as single quotes, hyphens, equals signs, and asterisks, users can easily create bold, italic, or colored fonts; different sizes of headers; bulleted or numbered lists; and horizontal page dividing lines (see Figure 8). To create a link for a new wiki page, one simply types two or more capitalized words with no intervening spaces ("CoolWiki" in Figure 8). After clicking “Save” in the page’s edit mode, the new home page is shown in Figure 9. The link to the new wiki page, “CoolWiki,” is highlighted at the bottom of the newly saved page shown in Figure 9.
Figure 8. Edit Mode of a New Wiki Home Page (with Content)

Editing Welcome Page

This is a sample page. To create a page, just type a bunch of text in here. Great for verbal learners!

If you want to get fancier, you can type italic text or bold text using single quotes, like this:

"italic text"
"bold text"

If you want to get fancier, you can use headers and bullets, like this:

- Large Header
- Bullet point
- Another bullet point

- Smaller Header
Typing words smashed together creates a link to a new page: CoolWiki

Summary of change:

Add document to category:

View document history

Figure 9. Saved Wiki Home Page with Content

Welcome Page

This is a sample page. To create a page, just type a bunch of text in here. Great for verbal learners!

If you want to get fancier, you can type italic text or bold text using single quotes, like this:

"italic text"
"bold text"

If you want to get fancier, you can use headers and bullets, like this:

Large Header

- Bullet point
- Another bullet point

Smaller Header

Typing words smashed together creates a link to a new page: CoolWiki

Comments:
By clicking the new page link, “CoolWiki,” shown at the bottom of the image in Figure 9, the user is taken to the edit mode of this new page, where the page can be filled with typed text and simple formatting, if desired.

**Figure 10. Easy Link to Create a New Wiki Page**

During the action research course, the students used the wiki to create pages for module assignments, journal entries, brainstorming, drafts of writing, bibliographies, and progress charts. The instructor used the wiki to structure the course, post assignments and samples of work, post course readings as PDF documents, link to external resources, and create chat summaries, among others.

The main disadvantages of a wiki stem from that fact that it is primarily text-editing software with few built-in structural features, although new permutations are constantly being developed. In the Tavi version, simple tables are the only graphic supported. Compared to the powerful word processing and image creation capabilities of such programs as Microsoft Word, Excel, and PowerPoint, the wiki is primitive. Thus, the wiki software privileges verbal learners and places visual learners at a disadvantage.
The wiki used for the LIS 699 was called the Mentors Wiki, because it was originally created to support the high school telementoring project. New pages were added to create the LIS 699 online workspace. In the static menu of links at the top of the page, in addition to the WelcomePage (home page), PageIndex, RecentChanges, and Preferences pages already discussed, there were also links to the internal email system, chat space, and editable course calendar. Figure 10 shows the top of the Mentors Wiki home page.

Figure 11. Mentor Wiki Features (Top of Page)

Welcome to the Mentors' Online Workspace (Wiki)!

Here you'll find an email system and chat space for sharing ideas and problems, a page for each of you to keep your mentor journal if you wish, a calendar for planning, an introduction to the project, and mentoring tips and other help. Click on the links below to find out more. This is a dynamic site - you can change it in any way to make it a more useful resource.

The other two wikis are for you to work with your mentees. They're not connected to this wiki, except that the email system and chat are in a single system that you can access from any of the wikis.

LIS 699

SinNineNine: The journey is underway!

Mentor Home Pages

These are our personal home pages in this Mentors wiki. We can create the content and add links for the new pages we create. It could serve as an index to all our pages. In your Mentor-Student wikis with your mentees, you can create a second personal home page to use as you need.

The wiki software keeps track of changes made. All previous versions of any page can be accessed using the "View document history" link at the bottom of each page, so users can restore the changed text if they change their minds. If they do not want to edit a page, but have something to say about it, they can use the Comments box at the bottom of any page. Figure 11 shows the bottom of the Mentors Wiki home page.
The page introducing the software included examples of how wikis have been used, such as for brainstorming, journaling, document management, document drafts, and discussion and review. Some suggestions for library-specific uses were also included, such as bibliographies of collections and frequently asked reference questions. It ended with the statement, “This is free, simple-to-use, and flexible software that has the potential for creative and dynamic applications. With your imagination, I’m sure you could think of wiki uses for your own classroom or school library media center.”

The website also provided access to a password-protected internal email system and chat space. Email was the primary means of engaging in one-to-one dialogue. Whenever a new wiki email message was sent, recipients were automatically notified via their external email addresses. Email could be organized in folder and “deleted,” but all deleted email was saved in a special folder accessible to its owner. Users could attach up to five files to each email message.

The chat program’s features included simple text formatting, user selection of background color schemes, choice of icons/avatars, and a selection of emoticons. Though the active chat screen lists only the
12 most recent messages, chat history provided access to all messages. Twelve ninety-minute chat sessions were held on Wednesday evenings. The instructor provided a summary of the chat discussion for each week’s module on the respective module page, as well on a page cumulating all summaries to date.

Rationale for the Course

The LIS 699 had originally been conceived as an adjunct to the telementoring project to give the graduate student mentors an opportunity to work on their own professional development. With time pressures and other responsibilities in the normal school day, many educators simply do not have time to reflect on their own teaching, look more deeply into what is happening in the classroom, clarify their beliefs about teaching, and sharpen their abilities to be inquiring. I visualized the course and action research in general as a garden where busy teachers could take time to explore, in a probing and systematic way, important questions and concerns that habitually had to be put “on the back burner.” I had even given this garden a name: Curiosity’s Garden. I had intended the course to be conducted mainly face-to-face. However, the mentors requested that we do it online since both were working mothers of young children.

My goals as facilitator of the course were to: (1) provide an environment conducive for self-awareness, questioning, and critical thinking skills; (2) provide a range of conceptual and practical action research tools; and (3) create an opportunity for knowledge to be co-created. My assumptions were that: (1) learning requires the social construction of knowledge, predominantly through discourse; (2) the affective dimension is a critical component of the learning process; (3) the products of the learning process should remain as a source of individual and community memory for shared learning and further reflection; (4) educational software should provide both adequate structure to guide learning and the flexibility to adapt to evolving learner needs; and (5) in general, qualitative research methods are more suited to action research than quantitative ones. In October 2003, I stated my philosophy of action research (AR) in the wiki:

AR is best done by practitioners who are motivated to examine themselves critically and improve their practice. The methods used can be eclectic and creative (including creating one's own data collection, analysis, and reporting means), but in general qualitative methods are better suited to AR. The most important factor in AR is self-awareness, achieved through critical reflection. Building on that, sharing and collaborating are important for self-learning and creating communities that work on improving practice together. AR can be empowering for individuals and groups and, as such, involves the courage to take risks.
Having no previous experience conducting an action research project, I realized that I would be a co-
learner with the students. I described the course as "a journey" that we would all take together. I felt I had
some research expertise to offer but that their questions and interests would guide the learning process. The
course began on January 17 with a face-to-face meeting in which I introduced the course. We planned to
have 14 synchronous sessions: three face-to-face meetings at the high school where one of the students was
teaching, and 11 chat sessions. During the semester, one of the face-to-face meetings was changed to a chat
session. We met face-to-face on May 8 at the end of the course.

Course Design

As stated in the course syllabus, “The purpose of the course is to explore action research as a method of
self-reflective practice and apply this approach to telementoring experiences” (see Appendix H for the
course syllabus.) This was intended to be a “getting-your-feet-wet” action research project. In October
2003, I posted my ideas about action research at that time in the wiki (Chart 12):

Chart 12. “What's Action Research?"

<table>
<thead>
<tr>
<th>What's Action Research?</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are a number of names and definitions for action research. Sometimes it's called practitioner</td>
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<tr>
<td>research, participatory action research, teacher as researcher, reflective practice, or collaborative</td>
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<tr>
<td>inquiry when it's done by teams of researchers.</td>
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<tr>
<td>Jean McNiff gives a definition that I particularly like: &quot;Action research is a name given to a</td>
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<tr>
<td>particular way of researching your own learning. It is a practical way of looking at your practice in</td>
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<tr>
<td>order to check whether it is as you feel it should be. If you feel that your practice is satisfactory you</td>
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<tr>
<td>will be able to explain how and why you believe this is the case; you will be able to produce evidence</td>
</tr>
<tr>
<td>to support your claims. If you feel that your practice needs attention in some way, you will be able to</td>
</tr>
<tr>
<td>take action to improve it, and then produce evidence to show in what way the practice has improved&quot;</td>
</tr>
<tr>
<td>And I really like this part: &quot;It involves you thinking carefully about what you are doing, so it can</td>
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<tr>
<td>also be called a kind of self-reflective practice. The idea of self-reflection is central. In traditional</td>
</tr>
<tr>
<td>(empirical) forms of research, researchers do research on other people. In action research, researchers</td>
</tr>
<tr>
<td>do research on themselves in company with other people, and those others are doing the same. No</td>
</tr>
<tr>
<td>distinction is made between who is a researcher and who is a practitioner.&quot;</td>
</tr>
</tbody>
</table>

In describing action research, I equated it with inquiry learning and identified five phases: (1) problem
identification, (2) plan of action, (3) data collection, (4) analysis of data, and (5) plan for future action. It
was challenging to select the most critical concepts needed to understand action research, find appropriate
readings, and then sequence them properly to give the students a foundation for conducting their own mini-
research projects. The criteria for selecting readings included: (1) addresses core concepts and issues, (2) presents ideas in a clear and accessible manner for novice researchers, (3) generally utilizes qualitative methods, and (4) supports data analysis of online communication.

Prior to the first class meeting, four modules were posted for the course: (1) Noticing as Inquiry, (2) Impartial Observation, (3) Validity Issues, and (4) Claims and Warrants. These four original modules addressed the need to be self-aware and reflective; the importance of achieving impartiality; issues of truth, accuracy, relevance, and meaningfulness; and how to present evidence in a rigorous and convincing way. After the first meeting, I structured the course for the remainder of the semester. Each week’s readings, assignments, and activities were presented in a consistent module format, in order to establish a structure and a rhythm for the course. I was guided by the principles developed by Wenger et al. (2002) for fostering communities of practice: (1) design for evolution; (2) invite different levels of participation; (3) develop both public and private community spaces; (3) create a rhythm for the community; (4) build trust and personal relationships; and (5) maintain community visibility.

At the same time, I felt that the course and the modules were “works in progress” and invited the students to suggest improvements at any time. I also indicated to them in the wiki that I anticipated taking a mentor’s role: “I expect to be working with you individually quite a bit online to help you develop your research questions, research proposals and studies, and research thinking. I expect much of that will take place as a response to your journals, so do put any kinds of thoughts you’d like feedback on in your journals. And please do email me anytime if you have specific questions.”

The weekly course assignments were aimed at helping students understand the core concepts of action research, apply these concepts to their telementoring experiences in an action research project, individually reflect, dialogue with the instructor, and discuss ideas with the whole group. The instructions were posted as: “(1) Consider: In the wiki pages provided in each module, discuss how the ideas in the readings for that week’s module apply to your research. The pre-discussion writing is aimed at helping you write some part of your proposal or report. (2) Question: Identify the issues you’d like to get feedback on and prepare specific questions to guide our virtual discussion about the topic of the module as applied to your research questions, design, or proposal. (3) Journal: Each week, journal entry about: (a) your telementoring with
your student, (b) your research project, and (c) your ‘aha’s.’ (4) Dialogue: Write Joyce [instructor] as needed for feedback or problem solving. (5) Chat: Group discussion via online chat or face-to-face.”

**Course Description**

The course learning objectives were that the students be able to: (1) Define action research. (2) Understand themselves as professionals by exploring their telementoring and other experiences as teachers. (3) Identify research questions related to telementoring. (4) Describe methodologies that can be used in action research. (5) Describe data collection, analysis, and interpretation methods used in action research. (6) Understand and apply ethical guidelines for action research (see Appendix H for the syllabus).

The students were required to: (1) communicate regularly with their student mentees and support and guide them through completion of their senior research projects; (2) attend LIS 699 face-to-face and virtual sessions; (3) communicate online related to LIS 699 learning, using wiki email and by creating and editing wiki pages; and (4) complete a student portfolio consisting of their journals, a research proposal, and a final research report. Their final products were self-assessed and also evaluated by the instructor.

Each week, the students read assigned readings and/or selected readings from the reading list. Prior to each chat session or face-to-face meeting, they posted their answers to the instructor’s discussion questions on wiki pages. They also posted their own discussion questions. As the semester progressed, the weekly assignments increasingly focused on applications to their individual research projects.

The students also submitted weekly journals to document their learning process. The wiki instructions were: “Each week, journal about: (1) your telementoring with your student, (2) your research project, and (3) your ‘aha’s.’” In general, journals were an opportunity to reflect on progress and served as the basis for further reflection with others – co-reflection. Topics included learning strategies, obstacles, motivation, successes, moments of insight, and reconsiderations. In addition, I kept my own research journal of teaching notes, methodological notes, theoretical notes, and personal notes.

The online course modules were designed to cover basic information about the research process and researcher skills (see Chart 13).
### Chart 13. Action Research Course Modules

Note: F2F = face-to-face; OC = online chat

<table>
<thead>
<tr>
<th>Course Module</th>
<th>Medium</th>
<th>Research Dimension</th>
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</thead>
<tbody>
<tr>
<td>First session</td>
<td>F2F</td>
<td>Introduction to Research</td>
</tr>
<tr>
<td>Module 1: Noticing as Inquiry</td>
<td>OC</td>
<td>Self Skills: Self-awareness</td>
</tr>
<tr>
<td>Module 2: Impartial Observation</td>
<td>OC</td>
<td>Self Skills: Critical Reflection</td>
</tr>
<tr>
<td>Module 3: Research Methods</td>
<td>OC</td>
<td>Methodology</td>
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<tr>
<td>Module 4: Insider Research</td>
<td>F2F</td>
<td>Practitioner-Researcher “Identity Crisis”</td>
</tr>
<tr>
<td>Module 5: Research Proposals</td>
<td>OC</td>
<td>Planning a Study</td>
</tr>
<tr>
<td>Module 6: Data and Evidence</td>
<td>OC</td>
<td>Collecting Evidence</td>
</tr>
<tr>
<td>Module 7: Data Analysis</td>
<td>OC</td>
<td>Analyzing/Interpreting Evidence</td>
</tr>
<tr>
<td>Module 8: Validity Issues</td>
<td>F2F</td>
<td>Analyzing/Interpreting Evidence</td>
</tr>
<tr>
<td>Module 9: Claims and Warrants / Writing Reports</td>
<td>OC</td>
<td>Analyzing/Interpreting Evidence</td>
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<td></td>
<td></td>
<td>Presenting Findings</td>
</tr>
<tr>
<td>Module 10: Ethical Issues / Coding to Theory Building</td>
<td>OC</td>
<td>Analyzing/Interpreting Evidence Ethics</td>
</tr>
<tr>
<td>Module 11: Researching Differently</td>
<td>OC</td>
<td>Evaluating a Study</td>
</tr>
<tr>
<td>Module 12: Practitioner Research Concerns</td>
<td>OC</td>
<td>Assumptions &amp; Weaknesses</td>
</tr>
<tr>
<td>Module 13: Qualitative Research Concerns</td>
<td>OC</td>
<td>Assumptions &amp; Weaknesses</td>
</tr>
<tr>
<td>Module 14: Noticing Concerns</td>
<td>OC</td>
<td>Assumptions &amp; Weaknesses</td>
</tr>
<tr>
<td>Final Session</td>
<td>F2F</td>
<td>Summary and Informal Evaluation</td>
</tr>
</tbody>
</table>

### Course Evolution

Each week as we worked through the readings and modules together, my understanding of action research deepened. In mid-February, I changed the weekly module assignments to focus on the students’ individual research projects. I suggested that the students survey the readings offered for each module and concentrate on those aspects that were most relevant to their research. I also suggested that they get feedback during the chat sessions related to the topic of the module as it applied to their research. I modified the modules to include more about data analysis.

At the beginning of March at a face-to-face session, Ruth mentioned that she was a visual learner and requested graphic representations of the action research process to help her understand it better. During spring semester break in the latter half of March, I posted several graphic models of the research process.
and a version of Curiosity's Garden, the metaphoric representation of the research process that I had created earlier to help clarify a vision of the course for myself. I also reorganized the course presentation in the wiki to provide a more visual, coherent, and synthetic view. The summary of scaffolding by Greg Sherman\textsuperscript{20} was a useful reference. This provides in-class and computer-based examples for six types of scaffolding: (1) \textit{Procedural/ Functional} guidance on how to utilize instructional resources and tools; (2) \textit{Process} guidance on helping learners understand their paths traveled within an instructional experience; (3) \textit{Conceptual} guidance on what to consider throughout the learning experience; (4) \textit{Metacognitive} guidance on how to think about problems (e.g., planning, regulating, and evaluating scaffolds); (5) \textit{Strategic} guidance on approaches to solving problems; and (6) \textit{Interpersonal} guidance for facilitating constructive collaboration and interpersonal interactions. I created new pages, providing tabular organizers with links to replace verbose instructions and explanations. New tables included “Course Organizer,” “Modules at a Glance,” “Matrix of Objectives, Activities, and Products,” “Rubric for Joint Assessment of an AR Study,” and “Rubric for Self-Assessment of Journals.” New pages included “Research Models”; “Module Map” linking research dimensions, modules, and readings; and “Project Planners” with a hypothetical example of how to use them. As a whole, this was a summary of my most evolved thinking about action research that was achieved largely through learning \textit{with} the students.

This was a challenging course for all involved. Several weeks after the course started, in her journal entry of February 6, Sarah expressed the nature of this intellectual and emotional challenge:

I've been wondering why the readings, the process of coming up with a “burning question” and the chats are so taxing on my brain – I mean, I really can't identify a time when I have had so many thoughts swirling through my brain. Although I have faced challenging experiences in the past, I don't think any of them ever taxed my thought processes. Exciting that it is your course that is doing this, but scary I went through college, teaching, other graduate courses before I "felt" my brain sloshing around.

I wonder too if I am feeling a little stress – good stress, the kind that leads you to wake up and notice things. Although I continually tried to improve my teaching methods and gather new evidence, I haven't done it this way and I haven't really “lived” the role of librarian/information specialist. Sometimes I feel overwhelmed – there is so much I need to learn and improve upon and I wonder why I'm starting over as a librarian just when I was feeling comfortable as a teacher.

\textsuperscript{20} http://pt3.nau.edu/resources/toolbox/what-are-scaffolds2.htm
In an email message accompanying her journal entry of February 9, Ruth expressed a similar feeling:

My apologies for my late journal. I need to do insider research on why I've been having so much difficulty with turning my journal in on time. I think it's because I have so much to say, and so many connections, I'm overwhelmed.

Learning about action research through both studying it and doing it required a serious commitment of time, energy, thought, and willingness to face anxiety and uncertainty. The result was a transformation to a higher level of thinking for all participants including the instructor, as will be shown in the following chapters.
CHAPTER 5. RUTH: THE CULTIVATION OF REFLECTION

PROLOGUE

The aims of the present study are to examine the co-construction of knowledge and how affect and interaction influence participant understanding of action research. The research questions are: (1) What are the key cognitive, affective, and interactional elements of the online conversations? (2) How do student-instructor interactions influence student understanding in the action research course? (3) How do student-instructor interactions influence course development?

This chapter addresses these questions through narrative analysis of Ruth’s learning experiences during the action research course. These are organized as a primary narrative consisting of: (1) Background (orientation), (2) Learning Action Research (beginnings), (3) Planning and Conducting Research (complicating action), (4) Final Paper (result), (5) Ruth’s Final Course Comments (student evaluation), (6) Research Case Analysis (researcher evaluation), and (7) Epilogue that realizes the narrative design of the learning stories constructed individually by Ruth and co-constructed by Ruth and the instructor. The research case analysis identifies Ruth’s most significant learning sub-narrative as well as key themes and issues: the role of reflection, the importance of the affective dimension, co-reflection and the co-construction of knowledge, and the role of online media in communication and learning.

BACKGROUND

Teaching Philosophy and Experience

Ruth King, a young mother, had been an elementary school teacher for the previous seven years, teaching second and sixth grades as well as music. Her degree specialization was science. When asked about her teaching philosophy in the initial interview on December 5, 2003, Ruth described it as child-centered, involving hands-on learning, inquiry learning, and building cooperative relationships:

I think that I really center on the child’s needs in my classroom... it’s very hands on. I want to make sure that the kids are doing, not only listening to what I’m saying... And I feel it’s also important for the kids to build relationships with each other. So there’s a lot of cooperative group work but also individual responsible learning. Since I’ve been to library school, I’ve implemented inquiry. So students are researching things that they’re interested in as opposed to what I want them to learn. Which I feel is very important because I feel a pretty big difference in motivation. It’s self-motivation.

21 All names of people and places (with the exception of the University of Hawai‘i) are pseudonymous.
**Research Experience**

At the start of the semester, Ruth had relatively little research experience. In the chat session on January 28, she stated: “I’ve mainly been a ‘researcher’ in my own classroom and consulted with my colleagues to try and resolve issues such as poor reading skills, and/or behavior problems. I have a personal interest in using music to motivate and teach reluctant readers so I’ve searched for articles regarding methods used by teachers in other classrooms.”

**Telementoring Experience**

Ruth began mentoring Jessica, a high school senior at Central High School, in January 2004. She replaced Jessica’s first telementor, Linda, who was unable to continue in spring 2004. She already knew Jessica, and Jessica was also coaching for one of her husband’s school sports teams. She felt this would be an advantage when using online communication. She was impressed with Jessica’s strong sense of purpose and motivation to overcome some major obstacles in her life: “She knows what she wants, so that’s really good. I’ve been wanting to help her, because I know what she’s been through. She was one of my students in grade 6. I know that she’s really trying hard, she’s had a hard time” (12/5/03).

Jessica aimed to become a sports broadcast journalist, entering the ranks of a small number of women in the field in Hawai‘i. She had experienced being mentored in two “job shadowing” opportunities at a local television station. She managed a number of school sports teams and was also the editor-in-chief of the school newspaper. She was an active and popular student who was voted “Ms. Central” at the end of her senior year. Like Corel, the other high school telementee, Jessica was a female member of the high school’s first senior class, and both were members of the same senior academy.

**Mentoring Experience**

Ruth had no previous experience mentoring students or adults. She had recently been mentored as a beginning librarian by Lee Suzuki, the library media specialist at Central High School (CHS) who was supervising the two high school telementees. This was a rewarding experience for Ruth: “The knowledge that she gave me is important to me, but I think more important than that I think is the relationship that we built together … she’s also a role model that I can look up to because she’s such an achiever and really
a model for self-learning" (12/5/03). Until April 13, Ruth also volunteered and worked part-time for Lee in
the CHS library and was able to see Jessica face-to-face twice a week.

**Online Learning Experience**

Ruth had previously taken one class that was completely online. In her pre-telementoring interview, she
described that experience as being challenging and uncomfortable:

> I actually had a class that was ... totally online, from the very first day to the last day ... without face
to face it was like shell shock ... The scary part is that when something is written as opposed to
spoken, it can be taken in a different way ... for me, I was very cautious about the way I wrote things,
because it was open to interpretation ... It was really a struggle for me in the beginning. I thought, oh
I don’t want to go on. I forced myself to go on, because I figure that’s the only way I’m going to learn
... I was so uncomfortable. (12/5/03)

For the previous five years, her primary online communication tool was Lotus Notes, the program used
system-wide by the Hawai‘i Department of Education.

**Relationship with Instructor**

Ruth and the instructor had not known each other before Ruth became involved in the action research
course and the telementoring project. They interacted and built a relationship primarily online but also
through eight face-to-face meetings, five related to course work, two interviews (December 2003 and June
2004), and at Jessica’s final senior project presentation (May 2004). Basically, they met face-to-face
approximately once a month from December 2003 to June 2004.

**LEARNING ACTION RESEARCH**

Awareness and reflection, impartiality and insider research, validity, and claims and warrants were the
major action research concepts that provided the building blocks for students to conduct their research
projects. The topics were presented through module readings and then discussed in chat sessions. Before
each session, students posted written responses in the wiki to discussion questions posed by the instructor
and posted their own discussion questions. The following sections are based on Ruth’s answers and reveal
her interests, concerns, and confusions, as well as the learning resources she brought to the course.
Awareness and Reflection

The first readings by John Mason (2002) on disciplined noticing and reflection significantly affected Ruth throughout the semester. Her written assignments and journal entries for the early modules indicate that she experienced a kind of awakening related to her awareness of self, others, and events in her life. In her assignment for Module 1 on “Noticing as Inquiry” (1/21/04) she describes noticing as “to be awake to possibilities, to see each situation with new eyes and not react according to established patterns.” She emphasizes the importance of focusing on “changing things that can be changed, considered appropriate to change, without worrying about things that can't be changed.” She also takes a view of reflection as “an effective self-exploration tool” that “entails a commitment to its value as a potential life-changing tool.”

Individual uniqueness also emerges early as an important theme: “I feel noticing goes to the core of seeing each student as an individual with a unique set of values, goals, strengths, weaknesses, and contributions he/she can make to the larger group.” The nature of Ruth’s awakening to noticing can be seen vividly in the following two early journal entries (Chart 14).


Frustration overwhelmed me as I searched in my kitchen drawers cluttered with rubbish and useless utensils. Why is searching for something so simple so difficult? As I asked myself that, I experienced a lightbulb moment related to what Mason touched upon regarding impartiality. As quoted by Mason, “The observation of others is coloured by our inability to observe ourselves impartially ... which suggests that impartiality starts with ourselves, for otherwise everything we think we are seeing in others may be a reflection of ourselves.” As I “uncluttered” my kitchen drawers, found a “home” for utensils so they wouldn’t be scattered in numerous drawers, and stacked dishes of similar use together, everything finally came together. Just like my kitchen drawers, impartiality is impossible unless one “unclutters” one’s account of an event by suppressing explanation, justification or as Mason says, “any use of emotive terms.” Without the clutter of things that didn’t belong there and by ordering the things that should belong there, finally I was easily able to find what I needed. It felt great to be able to open the drawer with confidence that what I needed to find, would be there. I feel the same applies to impartiality when you unclutter it. If you are able to suppress the need to “account for” or “justify” your actions, what is revealed is a deeper understanding of what happened and a confidence that emerges that reveals the truth behind the layer of self-doubt and need to constantly justify one’s actions.

Who knew cleaning out my cabinets would lead me to this aha. But it just goes to prove that when you take “notice,” at what you are doing, why you are doing it; deeper understandings and connections can come at the most unexpected moments.

Here, Ruth describes how an everyday experience unexpectedly triggered insights into impartiality. Her active self and reflective self were at work simultaneously. She uses concrete images from this
commonplace experience to shed new light on impartiality, exploring each to test for a meaningful connection and probe for deeper meanings. As she completes her task of cleaning her cabinet, simultaneously completing her parallel mental task of clearing her mind of confusion related to impartiality, she states, "everything finally came together." There are hints of a need to be less self-doubting and more self-confident. Ruth had taken "noticing" seriously, and this led to unexpected results. While her active self was straightening her kitchen clutter, her reflective self was making deeper connections. In her next journal entry, Ruth further probes her heightened awareness and its effects (Chart 15).

**Chart 15. Ruth: Journal, February 9, 2004**

As I happened to walk by the television last night, a particular phrase caught my ear as if an arrow had been shot through my heart. It seems that Mason's readings in particular has heightened my awareness of the littlest things, and seemingly meaningless events have magically transformed themselves into deep connections. I feel as if I am a walking sponge who is constantly making connections and "soaking" up observations of everyday phenomenon. This happened to be one of them.

As the script from Minority Report blared, the phrase spoken by a character "To see the light, you need to be the light" caught my attention. As I reflect on insider research, this phrase hits on an important key element. Taking a closer look at one's own practice allows you to not only examine how one teaches, but more importantly why particular actions were taken, what actions could have been taken, and places the focus on actions that can be controlled, your very own. Thus, "being the light" is the vehicle to making sense of the data collected and to determine how the data will shape or alter future actions and interventions. It also entails coming to a deeper grasp of the question: Who am I? What do I stand for? What do I believe in? Why did I make the choices that I did? Only by grappling with these questions, can "seeing the light" transform from a passive activity to an active integration of past, present, and future experiences.

To see the light, you need to be the light... To practice insider research... you need to be it.

In both journal entries, Ruth describes her "heightened awareness" using words synonymous with awakening – "this aha," "a lightbulb moment," "an arrow had been shot through my heart." Events that might seem meaningless to others (or perhaps to Ruth before) have transformed themselves "magically" into connections that make sense to her on a deeper level. Because of her heightened awareness, she has become a "walking sponge" for deeper connections. The questions she asks herself go beyond teaching practice to identity and the values: "Who am I? What do I stand for? What do I believe in? Why did I make the choices that I did?"
The writing gives evidence of the movement inward that characterizes psychological reflection, introduced in the reading for Module 1 (Mason, 2002: 18): “noticing, or what might be called psychological-reflection, starts with the ... first level [technical] but then moves inward towards sensitizing oneself (with the aid of colleagues) to notice situations in which alternative actions are possible, and then changing practices by choosing to act differently.” Ruth also shows an intuitive understanding of the qualitative research view that the primary research instrument is ultimately the researcher: “To practice insider research, you need to be it.” Insider research can be empowering because it “places the focus on actions that can be controlled, your very own.”

Near the end of the semester for Module 12, “Practitioner Research Concerns” Ruth notes that sustaining a heightened awareness for noticing and reflection requires time, energy, and discipline – again using a metaphor:

Being diligent about taking notes and reflections as they occur remains a battle. Like they say about exercise, it all starts by making a commitment, even if it is to simply put on running shoes everyday. Some days I feel energetic and have no trouble jumping on the treadmill for a two mile stroll. However, truthfully, some days I simply just put on my running shoes. The same can be said about maintaining “active noticing.” Some days I have no trouble rattling off dozens of sentences at a time. There are other days that just a sentence can be written. The point is however, that in order to compensate for the demands of energy and time, there needs to be a commitment to at least “put on my shoes,” at least to write one sentence of reflection a day. (4/13/04)

When asked in her final interview on June 12 to indicate the “modules in which you feel you made the most progress,” Ruth stated, “M1 Noticing as Inquiry. This module has made the biggest impact on how I view obstacles and problems around me. By focusing on reflection and by ‘noticing’ things around me, I view problems as opportunities rather than as obstacles.”

Mason characterizes the “discipline of noticing” as a movement that begins at the technical level but proceeds inwardly toward changing one’s practices by changing oneself. He suggests that this can become a research method – a type of systematic and disciplined reflective practice. In the end, Ruth seems to have taken Mason’s model as her guide. She particularly valued this as a tool for self-exploration, self-growth, and self-change.
Impartiality and Insider Research

For Module 2 on "Impartial Observation" (1/28/04), Ruth recorded her thoughts on impartial observation before and after doing the readings. Before the readings, she thought it was impossible to make an impartial observation because “observing anything void of a personal or emotional connection is beyond our human capabilities” and that it is “these very connections that make us unique as human beings.” However, being as impartial as possible “is important because it is these insights that allow for self-improvement and continued growth.” Important themes in Ruth’s narrative are reinforced here: individual uniqueness, self-improvement, and growth. Her reading of Mason validated that impartial observations are difficult, but opened her eyes to seeing them as possible through making a distinction between description (“accounts of”) and justification (“accounting-for”). In her action research project, Ruth developed her own methods for applying “accounts of” and “accounting for.”

In her writing for Module 4 on “Insider Research” (2/10/04), Ruth’s view of insider research emphasizes the opportunity to reflect on one's practice to improve interactions with others as well as within, to gain multiple perspectives, and to be empowered through the ability to understand and control one’s actions.

In her writing for the last module of the course, Ruth notes how she tries to achieve accurate and impartial observation with what seems to be a creative, imaginative way of looking at the world:

I am notorious for mixing reality with the imagined. I often find myself guessing at whether I actually experienced an event or had dreamt it. Because I know that this is a tendency of mine, I am more inclined to question my observations. I have tried to squelch these insecurities by recording observations as close to the actual event as possible. Mason suggests triangulation, having others observe the same event with you. One of the ways I can accomplish this is by having someone else look at the observations to see if a "clear" picture emerges. When I envision "clear" picture, what emerges is presenting a detailed scenario of what happened, devoid of commentary. As Mason suggests, "Instead of trying to prove that something happened, I can invite colleagues to see if they recognize what I am talking about and whether they can offer similar instances of their own." (4/28/04)

Ruth achieved a solid understanding of the issues of subjectivity and how to deal with them. The insider research approach appears to be attractive to Ruth because it values the unique perspectives of individuals while offering techniques for achieving a degree of impartiality and mitigating the effects of her imaginative ways of perceiving the world.
Validity

Dealing with subjectivity and being as impartial as possible are the foundations for achieving validity in insider research. In her writing for Module 8 on “Validity Issues” (3/9/04) Ruth suggests that this involves balancing two different vantage points: “it really is a balance between the ‘larger picture’ the essential questions being answered, and the ‘smaller picture’ the individual bits of data being collected. Although both are important, even more crucial is how those two viewpoints are aligned. As mentioned by McNiff, a validation group convenes to help the researcher accomplish that task.”

One interpretation of this statement is that the goal of research is two-fold: (1) seeking patterns that are generalizable to or recognizable in other situations that (2) value the unique particulars of the situation under investigation. This involves negotiation of meaning and collaboration with others. If this is a correct interpretation, Ruth has arrived at understandings that are the crux of qualitative research methodology.

In her journal entry of March 14, Ruth realizes that data triangulation provides the security of multiple, reinforcing interpretations. She uses another metaphor from her daily life:

As my son reached for his favorite blanket, duck, and stuffed snoopy I had an aha moment regarding data collection. My son for the longest time only had a blanket. At night, when he couldn’t find it, he would cry. Recently, he’d added to his security collection a duck and a stuffed snoopy. It’s made a big difference in helping him sleep through the night better. I thought about how this relates to data collection. Just relying on one source of data, or one interpretation of data independent of others means that you run the danger of "being without security rather easily." With no one else looking at the data, with no other means to observe the same phenomenon, you run the risk of being partial. However, by having multiple interpretations of data, it allows you to feel more secure that the data you collected accurately reflects what was observed. (3/14/04)

We see Ruth’s thinking process at work in achieving an understanding of the purpose and value of triangulation. Beginning with the idea of “security in numbers” – easily visualized and felt through the image of her son sleeping soundly with the three items from his “security collection” – Ruth extends this to include the concept of impartiality whose existence is threatened by subjectivity. She concludes with its personal meaning – her own need to feel secure about her interpretation of the data she will collect.

In her writings for the last two modules of the course (4/21/04 and 4/28/04), Ruth shows her understanding of validity through applications to her study. She notes that in order to make her study valuable and applicable to other situations, it is “necessary to make connections between studies previously done” and “conclusions need to lead the reader and act as a jumping off point so that the reader begins
thinking about how the information can be synthesized in his/her particular situation.” She also addresses the issue of generalization through the need is to “clearly explain methodology and justification for the selection of data collection methods” and “communicate with the reader clearly the steps involved in both the collecting and analyzing of the data so he/she is aware of the ‘path’ of how conclusions were drawn.”

Ruth appears to have a good understanding of the issues related to validity and been able to apply them conceptually to her own study. In her final report (discussed below), she describes how she applied these concepts and addressed her concerns related to validity.

**Claims and Warrants**

Evidentiary argumentation – the use of claims, warrants, and evidence – is the means by which findings are clearly, concisely, and effectively presented. In the readings for Module 9 on “Claims and Warrants” (3/17/04), Booth, Colomb, and Williams (1995: 90) explain the relationship between claims and warrants: “Your claim states what you want readers to believe; your evidence or grounds are the reasons they should believe it.” They define warrant as “a general principle that creates a logical bridge between particular evidence and a particular claim” (ibid., p. 112). They also note the criteria for testing the quality of evidence: accuracy, precision, sufficiency, representativeness, authority, and perspicuity (ibid., p. 96-104).

In the initial draft of her research proposal posted prior to the module on “Claims and Warrants,” Ruth was already considering the logical link between warrants, claims, and evidence in relation to the use of standardized tests. She questions the warrant that standardized tests are a reliable means to identify learning styles. Among her methodological weaknesses, she includes “the assumption that a student’s learning style can be identified as well as the bias and accuracy of the learning style inventory test.”

In her writing for Module 9, she explores these doubts through clearly and logically developing an argument questioning the warrant of using a standardized learning inventory that she used with both Jessica and herself. After completing the Solomon-Felders Index of Learning Styles Questionnaire, she first asks, “What do these results mean in terms of how I will teach differently? How valid are they? How meaningful will they be to me?” She then considers qualifications related to the underlying warrant: “How accurately can a multiple-choice test identify my preferences for learning? How does a rating of 7 differ from 9, or
11? How well did I understand the questions? How well do I understand how I learn?” She understands that the warrant must first be trustworthy before claims can be made and evidence produced to support them.

On her final questionnaire at the end of the course (6/12/04), when asked to identify the modules in which she felt she made the least progress, Ruth wrote, “M9 ‘Claims and Warrants.’ I’m still unclear with this module area. I’m weary of how a claim can be stated clearly.” That she was “weary” seems to indicate that she had expended some effort in trying to clarify her ideas but felt unsuccessful. The reason may be that Ruth is a strongly visual learner. Attaining a mental picture of the fundamentals of evidentiary argumentation may have been difficult. Regarding the use of metaphor in reflection, Cheryl Hunt (2001: 276) states that metaphors enable her to “transfer feelings into a space beyond my personal ‘gut reactions’ where I can begin to explore, explain, and sometimes share them” [italics added]. It seems clear that Ruth doubted the accuracy of any learning styles inventory. If she is similar to Hunt, she may have had difficulty finding the appropriate metaphor to allow her to explore, explain, and share her “gut reactions.” It may also be that the instructor failed to effectively present and clarify these difficult concepts.

PLANNING AND CONDUCTING RESEARCH

By doing research projects, the students demonstrated their understanding of action research concepts.

Focusing the research question was a difficult part of the research process for Ruth. Most of our interactions as student and instructor related to this. Ruth actively sought online feedback on her proposed research topics and project proposal and created a solid proposal that included a clear timeline of tasks. After that, she worked primarily independently until she encountered major problems toward the end of the semester. A face-to-face meeting was critical in helping her refocus. Otherwise, our interactions took place during chat discussions or because of instructor-initiated follow-up to her assignments and journal entries.

Conducting the research led to the complicating action in Ruth’s learning narrative. Her original focus was how she accommodated Jessica’s learning style in the online environment. When insufficient data led to a refocus on her own learning style, she was confronted with evidence of her biases as a teacher.
**Telementoring a High School Senior**

Ruth’s telementoring of Jessica through the final two quarters of her senior project was the raw material for the practical application of action research principles and practices. Ruth replaced Jessica’s first telementor, Linda, who was unable to continue after December 2003. Jessica’s senior project consisted of doing research on women in sports broadcast journalism, gaining practical experience as an intern with a female sports broadcaster, writing a final report, and presenting her findings to a panel of judges and invited guests. Her aim was to prepare herself for a career as a sports broadcaster. The internship was originally planned to take place during the school’s intersession break in early October 2003. Jessica was unable to secure an internship until the end of March 2004, which put her considerably behind schedule.

In her first journal entry on January 25, 2004, Ruth described the challenges of online communication, as well as her vision of her role as a telementor:

When I communicate on-line, I am very aware of my word choice and how it may be interpreted by someone else. As a teacher, with my communication with parents, I prefer to do so in person or over the telephone because I feel I am better able to respond to how they are interpreting my message. Whether it be through facial expressions, tone of voice, or speech volume, they all give me clues as to how the person is feeling. In addition, these conversations allow me to restate their ideas so I can clarify my understanding of what they are trying to communicate to me.

With this telementoring project, I am fortunate that I will be able to meet with Jessica both face to face and asynchronous on-line via e-mail ... The more I delve into this project the more I realize that to "mentor" someone is really to be a part of their entire life. Like any good "mentor" I also realize that I need to help her "learn to fish" as opposed to "give her a fish." By this I mean, I need to be a guide on the side that helps her through the process of learning about herself, her goals, and what the future holds for her. This telementoring project will help me come to an understanding of how I can help Jessica help herself achieve her goals this semester. (1/25/04)

Ruth volunteered and then worked part-time in the Central High School (CHS) library from January 12 – April 13, and saw Jessica twice a week. Not surprisingly, most of their interactions took place face-to-face in the CHS library rather than through email. Given the choice, most people are likely to choose face-to-face communication rather than online. Jessica was no exception, even to the extent of communicating face-to-face with Ruth’s husband for whom she managed a sports team, as Ruth noted: “In some instances some of the e-mails I have sent her have been answered via my husband (She tells my husband at practice her responses to my questions, and my husband tells me) – go figure.”

The total number of email messages sent by Jessica to Ruth from January 12 to May 28 was 14, with a total of 1,141 words, an average of 82 words per message. Topics were related mostly to her senior project,
including: (1) request for help creating follow-up questions for career mentors; (2) request for feedback on her senior project proposal; (3) request for help developing interview questions for her internship (“job shadowing”) with Ann Sato in March; (4) news about the internship; and (5) request for feedback on the storyboard for her final presentation. The longest email message Jessica sent to Ruth was the earliest, sent on February 17, thanking Ruth for the Valentine treats she had received and asking for help with follow-up questions for career mentors. In this message, Jessica gives evidence of her difficulties with spelling and grammar. Clearly the face-to-face interaction had already taken a primary role in the mentoring relationship, as indicated in the last line of that message:

Aloha Mrs. King,

Thank you so much for the treats. I had a great valentines day. But sadly i wasn't able to go to the game due to I had family over the house for a party, but i did congradulate my friends. For the follow up questions i could only remember two that i was going to ask. If you don't mind helping me come up with some more i would greatly appricate it. the two that i have is: 1. Do you recall who was the first women sports broadcaster or who laid the ground work for women today? 2. Do you have to know knowledge on all the sports or just the wones you work on? I'll be working on my proposal some more today so i'll send it to you later in another email. Hope your weekend was full of treats. I'll see you tomorrow.
-- Jessica (2/17/04)

During the same period, Ruth sent Jessica 24 email messages with a total of 2,801 words, an average of 117 words per message. Topics related to the senior project included: (1) draft proposal comments; (2) advice on questions to ask career mentors; (3) internship plans; (4) comments on the storyboard for Jessica’s final presentation of her senior project; and (5) offering help for the final presentation. In many cases, the email messages were a follow-up to things discussed face-to-face. Ruth’s response on February 17 to Jessica’s message above was the longest email message she sent to Jessica:

Hey Jess:

Yeah, I was so happy to finally get an e-mail from you... :) not that I don't enjoy talking to you in person... ( but it's nice to know the e-mail thing works too.

I think we talked about two more questions on the day you received your reply. One had to do with how much knowledge and expertise of technology is required for their job, for example do they have to know how to edit video, do voice overs, etc. How much of their correspondence with potential interviewers are done via e-mail, telephone? Is computer proficiency a must? How do they utilize technology in their work day.

The other I think we talked about was how much preparation time goes into an interview. What is needed in order to prepare intelligent sounding questions? Do they conduct research? How much?

Were you planning to send a thank you gift to the person (I'm sorry I know you told me her name but I can't remember) who replied to your e-mail. Maybe we can brainstorm together, something small from Hawaii that we could mail to her as a thank you. Let me know what you think.

Shhh...I also thought we could plan a secret lunch as a thank you to ms. suzuki, ms. okino, and ms. mori. We'll keep it undercover so we can surprise them. Let me know what you think.

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Ruth’s mentoring of Jessica was far richer face-to-face than online. For example, on February 16, Ruth reported in an email message to the instructor:

On February 2, Jessica was excited that she had received a response to an e-mail she had sent to an ESPN reporter. Jessica had asked the reporter if she would be willing to help answering some of the questions for her project. Jessica and I reviewed the questions together. I probed her to also think about possible discrimination from players, in addition to fellow reporters. We also talked about how a female reporter might be approached differently if asked to conduct an interview in a male locker room. We revised the questions together and she e-mailed the questions to the reporter. (2/16/04)

Because she had the opportunity to see Jessica face-to-face, she was able to be more a part of Jessica’s life and give her the caring support she had envisioned giving as a mentor. In her journal entry for February 15-21, she describes Jessica’s excitement at being accepted at a local private university after having been rejected by the University of Hawai‘i and shares the fact that Jessica is an inspiration to her:

I quickly gave her a hug and said, “Oh, you must be so excited.” … The more I get to know Jess, the more I realize that despite her difficulties with grammar in her writing, what that SAT failed to [see] was quite profound. No one works harder than she does, and she readily jumps in whole-heartedly. Although I am her mentor, I feel that she has been an inspiration to me. For her to continue living her life, despite the many obstacles that have been thrown in her path, is truly a lesson others can live by, certainly me … Because Jessica has a clear outcome in mind, she perseveres despite personal obstacles, and takes every opportunity to make connections with individuals already working in the field. My challenge as her mentor, is not to just help her, help herself remain focused, and committed to her goal, but help her refine the baby steps she needs to take in order to get there. (2/21/04)

Even though Ruth and Jessica were not strangers at the beginning of the telementoring relationship, it still took some time to develop openness and trust. On February 25, Ruth wrote in her journal: “It took her a while before she finally sent her draft to me, but what seemed to ‘open her up’ to me giving her feedback was a small Valentine’s gift I gave to her.” Ruth found it important to give the relationship-building priority over assisting with the senior project, as she noted in her journal entry for February 22-28:

This week has been a rough journey for Jess. She went to see the grief counselor on Wednesday so I was unable to get in contact with her. On Friday, knowing that she’d had a rough week, I just simply gave her a hug. The cues that she gave me told me not to ask, how you’re doing, but instead said, just be there. I waited until she approached me and she shared with me that she contacted Ann Sato who she’ll be interning with over the spring break. She was a little more upbeat, and we chitchatted about ‘Happy’ things such as prom and her nomination as Ms. Central. Looking back on this week, it seems that I’ve failed miserably at directly helping her with her senior project, but I felt I did what I needed to do to best meet her needs at the time. I guess the biggest lesson I’ve learned this week is, you need to take care of a person’s basic needs before any learning or higher-order thinking can occur. (2/28/04)
Ruth continued to be open and receptive to learning from Jessica. In the following excerpt from her journal entry for February 29-March 6, she hints that she herself struggles with issues of self-confidence and the need to empower herself, finding Jessica to be an inspirational example:

Although I am her mentor, I feel she's taught me a lot more. She's not only overcome personal obstacles in her life, but also educational obstacles as well. By this I mean, she's not a good test-taker, as she put it, and struggles to clarify her ideas in writing. Despite these perceptions, she persists to follow her dream of becoming a sports broadcast journalist. I need to learn from her, as I am often victim of second guessing myself and my abilities. I need to stand up for myself, just as Jess does everyday. This is just one of the lessons Jess has taught me. (3/6/04)

On March 16, in response to the instructor/researcher's request for supplementary information to a journal entry, Ruth reported recent face-to-face activities to mentor Jessica through the research process.

Face-to-face I spent about 20 minutes on Wednesday, and 10 minutes on Friday. I helped Jess refine her interview questions for Ann Sato. (after trying for more than 8 months, Jess finally secured an internship and job shadowing) We worked on a plan of what her goals were for the job shadowing, for example what documentation she would need to include in her final report, pictures, video camera and also what research questions she was going to ask Ms. Sato at the news station.

We talked about how important it is in the research process to persevere and that the research process is not linear. We talked about how off course everything was because she couldn't get an internship as planned. However, low and behold it finally came through and now she is gathering more data, from someone in the field working in Hawaii willing to share all of her knowledge about women in sports broadcasting with her. We also talked about how important it is when doing research to have a variety of sources such as books, journal articles, first-person interviews.

She worked on her second draft and sent it to me. This week, we are working on refining it. She is also compiling a binder with all of the work that she has completed so far. They include e-mail exchanges with her telementors both with Linda and myself as well as any other kind of resources she has used. (3/16/04)

The face-to-face interaction seems to have been very important, as Jessica was not adept at writing and seemed to prefer even face-to-face communication through a third party rather than online communication with Ruth. As she had mentioned in her initial interview, Ruth also preferred face-to-face interaction because it allowed her to perceive the emotions attendant to what was said and to immediately ask for clarification. Under these conditions, what they discussed above in 30 minutes would surely have taken much longer via email, with conceivably less personal satisfaction for both Jessica and Ruth.

Ruth’s action research project (discussed below) focused on how to accommodate Jessica’s learning style in an online environment. Ruth implemented some strategies for this, based on a learning style inventory that both she and Jessica had taken and then discussed. On April 11, Ruth reported that she had emailed Jessica a matrix to help her organize her interview responses from Ann Sato. She also provided
Jessica with a visual picture of the research process presented as a large flower. These were apparently the only online strategies she implemented.

From the summer of 2003, Jessica had been trying to arrange an internship with Ann Sato, the first female TV sports anchor of a major broadcast station in Hawai‘i. After many months of trying, she was finally able to arrange this during the intercession break between CHS’s third and fourth quarters in spring 2004. At Jessica’s final presentation of her senior project on May 28, 2004, Ann Sato was one of the members of the audience, to Jessica’s gratification. Ruth and the instructor were also present.

**Focusing the Research Question**

Through email messages and wiki page comments, Ruth and I as instructor had an early, extensive online exchange related to focusing the research question and developing her research proposal, which is excerpted in this section. Ruth’s first topic apparently arose from her experience of being mentored by Lee Suzuki: “beginning librarians being telementored by experienced librarians regarding the implementation of standards based information literacy lessons, or ways to get collaboration off the ground” (2/3/04). I clarified that the course design assumed a focus on current practice, i.e., her telementoring of Jessica. She then revised her topic to “how a previous relationship aids or hinders a telementoring relationship” (2/4/04). Here, she seemed to be considering how Jessica’s relationship with her previous mentor, Linda, might affect her own mentoring of Jessica.

After a face-to-face class meeting in early February, during which the group briefly discussed learning styles, she revised this to, “How can learning style preference (of mentor and person being mentored) be accommodated in a telementoring environment?” (2/5/04). Her explorations of the literature led her to consider other broader topics: “How can constructivist teaching be enabled and fostered through telementoring? How have my experiences and struggles as a parent influenced my teaching and views on the telementoring experience?” (2/17/04). She also noted, “I am still feeling very overwhelmed.”

In a long email response, I summarized all the research questions she had considered so far and posed questions to help her make a choice:

22 Icons denote changes in speaker. Ruth’s icon is Ø. The instructor’s icon is ▶️.
Consider what assumptions you hold that are behind each question. What knowledge and past experiences propel you to ask the question?

How will you answer the question? i.e., what kind of evidence will help you answer the question? How will you gather that evidence?

What do you imagine your report of findings might look like? (2/18/04)

I then considered each of her proposed research questions in light of these questions. I tried to remain neutral in considering Ruth's questions, without encouraging or discouraging her pursuit of any particular question. However, my aim was to help Ruth balance interest with efficacy in completing a research project in one semester.

Ruth then returned to a focus on accommodating learning style differences and posed these research questions:

1. What kind of strategies can be used and developed to accommodate a student's learning style preference on-line?
2. How does accommodating a student's learning style differ on-line versus in face to face interactions?
3. What are the potential benefits (specifically affective) as well as limitations of these strategies? (2/24/04)

In a wiki page, she proposed to collect data through a learning style inventory, interviews, and learning logs. I immediately followed up with questions on her wiki page to help her refine and extend her thinking:

Ruth, you made an excellent point in our F2F meeting a few weeks ago: The research questions and methodologies are intertwined and should match each other. Let's try to tie the data collection methods ... to your research questions and see if there's a need to refine the questions or the methodologies ... Let me ask a few questions for you to think about: (1) What kinds of data will you need to answer each of your research questions? (2) What data will your four methods provide? (3) Is there a good fit between #1 and #2 above? Is anything missing? For example, will you need to analyze and compare specific F2F and online interactions between you and Jessica to identify how you've accommodated her learning style? If so, what methods could you use to do this? (4) What can you realistically expect to be able to accomplish toward answering your research questions this semester? Do the questions need to be refined?" (2/25/04)

In response, on February 25, Ruth chose her research question:

Thanks for your feedback. After our discussion tonight [in chat] and after thinking about the questions you've posed, I've come up with one single word ... simplify. In my attempt to clarify my thinking, I've made things more difficult than they need to be. My research question is: How can a student's learning style be accommodated while in a telementoring relationship? What are the potential benefits (specifically affective) as well as limitations of these strategies? My steps would be:

1. To identify how researching this question will make me a better mentor. Why is it important to me? To my teaching?
2. To identify Jess's preferred learning style through inventory and interview. In my proposal, I would also need to point out the limitations and bias of the inventory as well as the debate of
whether a learning style can be accurately identified at all.

3. Research general information related to learning styles (positive as well as criticism of),
information related to accommodating learners on-line, and if it exists in a telementoring
relationship.

4. Using the strategies identified in the background research conducted, I would choose 3 strategies
to use with Jess. The strategies selected would be based on the task I'm helping Jess with. In my
final research project, I will elaborate on why these particular strategies were used, based on
research and personal experiences.

5. My Observations will be recorded in a Thinking Rubric with the following questions: What am I
doing? What does it mean that I choose to do it this way? How is the student responding? How
did I come to do and see things this way? What do I intend to change? For each question I would
record my first reaction, revision, and followup notes. I would like to make connections between
my experiences as a teacher and now as a telementor with regard to accommodating learning
styles, but am not sure where that would fit. (2/25/04)

As instructor, I felt Ruth had quickly and skillfully narrowed her topic to a scope feasible for the time
available. I responded in a comment on her wiki page:

► Ruth, you seem to have had a flash of insight here! You've zeroed in well on your focal point.
Your new question clearly focuses on two variables -- student's learning style and your actions to
accommodate it -- and states the telementoring relationship as the parameter for what you will study.
This seems well focused and doable to me. (2/25/04)

I continued the wiki page comments with affirmation and other feedback on each of her five points, as
well as offering suggestions and other resources. On March 2, Ruth posted the first draft of her research
proposal on the wiki. She provided brief information on the background, study purpose, exploratory
research questions (including addressing her own learning style), scope, literature review, methodology, her
role as action researcher, instruments, timeline, and methodological assumptions and weaknesses. Though I
made suggestions to help her clarify her thinking, my comments to her indicate how well developed her
proposal seemed to be:

► I think this proposal is well focused, coherent, and basically sound. Your single research question
is clearly stated and visible throughout the proposal. The methods you've chosen will elicit the data
you need to answer your question. I think it's an impressive achievement for your first action research
proposal. (3/2/04)

Realizing how little time she had, Ruth struggled with whether to include how her own learning style
had influenced her communication with Jessica. She concluded that because “it is inherently connected to
my research question … I cannot adequately conduct my research of methods of accommodating Jess's
learning style, without examining mine” (3/2/04). I concurred and also made suggestions for creating
interview questions and conducting interviews.
In this episode related to focusing the research question, I attempted to assist Ruth in brainstorming possibilities for her research project, identifying potential problems, choosing research strategies, and composing a plan that was realistic and workable. I validated her many strong ideas and attempted to provide guidance, encouragement, and support.

**Emotional Challenges and Learning Support**

For Ruth, the research process was complex, multilayered, and challenging. She attended to three new activities simultaneously—learning about action research, telementoring a high school student, and conducting a research project. This section will discuss the emotional discoveries and challenges Ruth encountered and the affective aspects of the Ruth-instructor interaction.

The feeling of being overwhelmed appears to have been constant, beginning with her first mention of it in an email to me on February 17 as she was focusing her research question. For her project proposal on March 8, she set out a timeline for “chunking the large project into smaller steps with specific deadlines.” After completing the proposal, she realized that she had “taken too long to come up with a proposal and … there is little time to really look at the data. I feel that I spent a lot of time at the top of the hill preparing to go down the hill, thinking about how, and when, etc. Now, I’ve started my descent down the hill and I have no time to think about how I’m going to land. I’m freefalling and perhaps the greatest lesson of all is just live it, experience it, both the bumps and bruises, and just pray for a smooth landing” (2/17/04).

At the face-to-face class meeting on March 9 for Module 8 on “Validity Issues,” when asked how the course might be improved, Ruth mentioned being a visual learner and suggested that graphic representations of the research process might help her understand it better. Being a verbal learner, I had not considered viewing the wiki from the point of view of a visual learner. The following week I began a comprehensive effort to make the wiki presentation more visual, coherent, and synthetic. Ruth emailed that she appreciated my efforts. As discussed later, my accommodation of her learning style was apparently one of the consequential events that contributed to her realization of her own biases toward visual learners.

In response to follow-up questions on a journal entry, on April 1, Ruth noted how understanding another’s learning style could serve not only the cognitive goal of better understanding but also affective and relationship building goals.
The biggest aha for me regarding my research this week is that I set out to learn Jess's learning style so that I could help her in terms of understanding the research process and writing. However, what seems to be happening is that learning about her learning style has taught me how to build a better relationship with her. Quite interesting, but profound I think because no learning can occur until we feel another person values us for who we are and seems to understand us unconditionally. I think it has also made me a better parent because I understand that my son doesn't learn exactly how I learn. This statement seems quite simple, but it really was an aha for me. I think there is an assumption that everyone learns like us. Understanding that this is not reality is a wake-up call. (4/1/04)

This quote, juxtaposed with the following quote from her final paper, seems to indicate that the Ruth's view of the relationship between her and myself as instructor also improved due to the changes I made to the wiki:

By allowing students to learn through methods they are comfortable with, we acknowledge that how they learn is important. I experienced this firsthand as a telementee, as additional visual material was added to the instructional Web page. It allowed me to 'see' the research process through the addition of charts, diagrams, and a metaphor. It affected me cognitively and emotionally. I now not only had a mental picture that I could refer to, but the feeling of being acknowledged transformed into increased motivation and a desire to learn more. (5/14/04)

In a journal entry on April 11, Ruth vividly reiterated her feeling that she was out of control in handling the research process, but this time with a sense of confidence that she would be better able to handle similar situations in the future:

Because of the extreme time constraint, I'm collecting the data and then having to analyze it immediately ... which leaves a lot of margin for error. I feel like I've been pushed off the hill. I started rolling slowly at first trying to hone in on a topic and now I'm on my way down the hill flailing and hurtling to the bottom ... I'm hoping that it'll be a soft landing, but I know that I'll be all the more determined and 'stronger' knowing that I've examined my own teaching and built meaningful relationships. (4/11/04)

Having observed the sparse email communication between Ruth and Jessica from the beginning of the semester, as instructor I was concerned that Ruth would not have sufficient data to answer her research questions. At the beginning of the semester, she mentioned that she would be volunteering in the CHS library only until a new library assistant was hired. Email communication with Jessica would begin in earnest after that. On March 9, Ruth mentioned that the assistant had been hired, but that she had also been hired to work part-time at the CHS library on a research project. On March 15, I emailed my concern to Ruth and suggested that she consider what the effects on her research project might be.

On March 29, after the university's spring break, I again emailed Ruth to express my concern about her project. She responded the following day, thanking me for my concern and informing me that she had
been hired as a library assistant at a different library. She would begin communicating with Jessica completely online beginning April 12, and she felt she could still complete her project as planned.

Ruth scheduled a face-to-face meeting on April 17, and we discussed how she could complete her project and final report by May 14 with the data she had gathered so far. After brainstorming and considering alternatives, Ruth changed her focus to examining her learning style through her experiences as both a telementor of Jessica and a telementee in the action research course. The next day, she emailed me saying she “left refreshed and refocused.” In the final interview, Ruth described the research process:

> I think at first I thought that I’d have a handle on everything, but as I got into it, things started to get out of control. To me, I think the thing that hit me the most was the complexity ... it seems to me the more you try to control it, controlling the research project and everything in it, the more out of control it gets. And then you try and convince yourself that you have control over it. The biggest thing is to realize that you have to let it go. It kind of has like a life of its own. And that you have to deal with it. And then if you do that, everything starts to fall in place. (6/12/04)

When I asked at what point she realized that, she said, “I think after I had that meeting with you face-to-face. You kind of helped me problem solve. Up to that point I had no idea how I’m going to do it.”

Our last major online interaction as student and instructor occurred as Ruth was writing her final paper. At the final face-to-face class meeting on May 8, it appeared that Ruth had brought a draft of her final paper in a large envelope, ready to submit for comments. However, she did not turn it in. Later, I emailed her inviting the draft, which she then submitted. I returned the draft with my comments. On May 13, Ruth emailed her response: “Thanks for your helpful comments. I like how you embedded the comments within the document. If you hadn't built such a caring and nonjudgmental relationship with me throughout this semester, I wouldn't have thought of sending the draft, really sketchy draft to you. Thanks again for all of your support.”

**FINAL PAPER: SELF-DISCOVERY, SELF-CHANGE, & HELPING OTHERS**

The culmination of Ruth’s work was her final paper, submitted on May 14. In it she demonstrated her skills at noticing and reflection, examined herself in light of past and present experiences, revealed a changed view of herself as a teacher, and looked ahead to her future practice, feeling empowered and confident.
"The Harvest of Self-Discovery"

The title of her paper was “The Harvest of Self-Discovery,” with a unifying metaphor of plowing, planting, and harvesting a spring crop (see Appendix J for the outline of her final paper as posted in the wiki). The introduction and background of the study was the “soil” in which she planted “seeds of self-discovery” about her own learning style. Reviewing the literature – “plowing the field” – allowed her to delve deeply into previous studies and “intermingle” their soil with that of her current study. Methodology deals with why and how the seeds are planted and how long they should grow. Findings are the harvest that “will lead to an unearthing of various truths” and “lead to a new cycle of planting.”

The purpose of Ruth’s study was to examine her own learning style both as a mentor and mentee to better understand how learning style determines how we create knowledge and how this influences teaching practice. Her ultimate goal was to achieve a better balance of instructional methods. She defined learning style as “how a person attempts to makes sense of the world around him/her. It is how a person makes connections between new material being introduced and prior knowledge that already exists. Ultimately, it is how a person ‘pulls’ and selects the pieces of a ‘puzzle’ together and arranges them in a way that makes sense.” Her research questions were: (1) How has my understanding of my learning style changed due to my experiences as a telementor and telementee? (2) How will my examination of how I learn best, impact my future teaching practices in a virtual environment?

Ruth collected her data through journals, the Solomon-Felder Index of Learning Styles Questionnaire, an interview of Jessica’s previous telementor, and a log of her interactions as a telementor with Jessica and as a telementee with the instructor. She developed her own method of using her journals to gather data:

I also kept an “intimate journal” which I recorded reflections of my learning style in two separate columns. The first column labeled “what I did” was the location for recording what happened. The second column labeled “what I learned” contained reflections and connections to past experiences. Color coding of the “accounting-of” and “accounting-for” attempted to not only separate observations from reflections but was also used to identify key words or phrases. (5/14/04)

She recognized the methodological weakness of using journaling when the researcher “has a vested interest” in how the data will be analyzed and interpreted. She addressed this issue of subjectivity by separating the descriptions from her interpretations. She notes, “Although difficult, it was a conscious
decision to bring forth awareness that there is a distinction ... It is a struggle because the distinction between accounts-of and accounting-for is necessarily fuzzy: all language involves interpretation."

Ruth acknowledged that her paper still required much more work, including devoting more time to careful data analysis and involving others to provide comments, criticism, and alternative interpretations toward the goal of achieving higher validity. Though her literature review and description of methodology needed to be strengthened, the final sections ("Findings" and "Summary and Conclusions") presented clear findings, richly supported by her personal experiences as a parent, elementary school teacher, mentor to Jessica, and mentee in the action research course. Her critical reassessment of her assumptions and biases regarding favored learning styles and her recognition of her own need for growth and "replenishment" signal that a transformation had occurred in her view of herself and her various roles in life.

She expresses a sense of empowerment through her desire to continue learning and growing, through her intention to implement a greater variety of teaching strategies to help her students, and through the recognition that she gave herself the "gift of self-awareness." As her instructor who was dealing with the same issues of accommodating students with learning styles different from my own, I found these sections enlightening, vivid, resonant with my own thoughts, feelings, and experiences, and very moving.

Investigating Learning Styles

The picture Ruth presents of herself as a learner is organized by the four dimensions of learning styles of the Solomon-Felder Index of Learning Styles Questionnaire:23 active/reflective, visual/verbal, sequential/global, and sensing/intuitive. According to Felder and Solomon,24 active learners tend to retain and understand information best by doing something active with it (discussing or applying it or explaining it to others), while reflective learners prefer to think about it quietly alone first. Visual learners remember best what they see (pictures, diagrams, flow charts, time lines, films, and demonstrations), while verbal learners get more out of words (written and spoken explanations). Sequential learners tend to gain understanding in linear steps, with each step following logically from the previous one, while global

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23 http://www.ncsu.edu/felder-public/ILSpage.html
24 http://www.ncsu.edu/felder-public/ILSdir/styles.htm
learners tend to learn in large jumps, absorbing material almost randomly without seeing connections, and then suddenly "getting it."

Before completing the questionnaire, Ruth predicted that she would be a reflective, visual, sequential learner (omitting the sensing/intuitive dimension). The evidence she provides for each dimension consists of her experiences as teacher, student, and mentor. She recalls being an extremely visual learner from her childhood days as a student, including the experience of having her math assignment thrown away by a teacher who did not appreciate her drawings of ideas. Ruth's reflective nature was expressed in the need to think quietly about problems before tackling them, and to "prefer to work alone prior to collaborating with others." She describes how this affected her participation in the action research class chat sessions:

When chatting on-line as part of the LIS 699 class, part of what made it uncomfortable for me, was the lack of think time that the format allowed. I felt a need to reflect on my word choice, sentence structure, and wanted badly to draft what I was going to say before I even posted my comments. I perceived the discussions as rapid-fire question and answer sessions in a game show format. At any moment, I waited for the game show announcer to say, "Sorry, times up." (5/14/04)

Because it was designed to cater to individual learning needs as the students' research progressed, the course modules and readings were originally skeletal and were fleshed out and revised over time. Ruth discussed her reaction as a sequential learner to the flexible and evolving nature of the course:

Before the "light goes on" I need to gain understanding in linear steps, with each step following logically from the previous one. This is especially the case when I am learning something new ... As a student I have difficulty with teachers who jump around from topic to topic or skip steps. This not only makes learning the material difficult, but I also have difficulty retaining the information. The on-line format that facilitates frequent schedule changes and format changes proved difficult for me as I expected the information to remain static. (5/14/04)

Ruth also scrutinized her own teaching experiences, reflecting on memories of past experiences with students who learned in a different way. She came to a new understanding of the reasons for their behavior, rooted in a different learning style:

The need for consistency of the information presented, is a reflection of my desire to keep things "in order" in sequence. As I reflect on my teaching, I find that I get irritated at students who skip steps to complete projects. Why can't you do #1 first, #2 second I ask them? Their answer to this question is simple: I can't do #1 and then #2 because the order of things doesn't really matter to me; your #1 is different from mine. Here too, my reflections and predictions of my learning style have led me out of the darkness. Although I am still "squinting" from the sudden brightness that has emerged in front of me only through constant reflection of my teaching will I be able to adjust to the brightness of the "light" otherwise known as self-discovery. (5/14/04)
During the process of making her predictions, she came to realize that, although she had attempted to be sensitive to different learning styles, she had not in fact been teaching to different learners:

Because I am such a visual learner, my reflections pinpointed a missing component of my teaching ... What about students who may be distracted by pictures? In all my years of teaching, I hadn’t considered visual images as negative. Why? Because as a learner I value them. Although I had convinced myself that every child learns in a different way, my limitation of auditory teaching put my students at a disadvantage. Instead of helping them, I actually crippled them. Rather than presenting a balanced representation of both auditory and visual learning tools, I had swayed the tide in my favor, to learning that was comfortable for me, rather than making learning more comfortable for my students. (5/14/04)

Cheryl Hunt (2001: 276), also a visual thinker and teacher, describes this issue in a similar way, pointing out the difficulty of seeing through the eyes of others with a different learning style:

Before I became consciously aware of doing this, I used to draw diagrams and create word-pictures for my students in order, literally, to illustrate points that I wanted to make. Many students would nod happily and could evidently ‘see’ what I was trying to say. Others looked slightly puzzled and one eventually told me that she found it ‘impossible to see pictures in my head’. To this day, I find it almost impossible to imagine what it must be like not to see pictures—but I do now try to acknowledge that there are other ways of creating internal representations of the world, and to adjust my teaching accordingly.

"Putting on My Oxygen Mask"

Ruth had apparently not examined her own learning style in the past because taking time for her own learning was counter to her belief that she should put her child’s and students’ needs before her own:

While on a trip back from the Big Island, the in-flight safety instructions blare, “If a sudden change in cabin pressure should occur, secure your oxygen mask first, before assisting your child.” ... The underlying message ... is that if you want to be able to help the “weaker person”, you need to make sure that you have been taken care of first. This statement is almost counterintuitive to what I’ve been taught. For example, I bought into the belief that as a parent you always put your child first. You give, give, and give to your child until there is nothing else to give ... What is missing however is how will the caretaker be replenished? If the caretaker is depleted then how can he/she “give” what he/she doesn’t have? If relationships are neglected because of the child, is the environment that is created from this void detrimental rather than beneficial to a vulnerable child? Although there are no easy answers to these questions, it is obvious upon reflection that in order to help others, you need to take care of yourself first ... In my teaching, I had always put my student’s learning needs before my own. While I encouraged them to pursue lifelong learning, I neglected to follow my own advice. (5/14/04)

The action research course apparently provided Ruth with the opportunity and some of the tools to “replenish” herself and “pursue lifelong learning.” It will be recalled that in one of her early journal entries Ruth wrote that she felt like a “walking sponge who is constantly making connections and ‘soaking” up observations of everyday phenomenon.” Using events in her life as metaphors, she used her research report
to probe the deep questions she had asked in an early journal entry: “Who am I? What do I stand for? What do I believe in? Why did I make the choices that I did?”

“Seeing in Color”

At the beginning of the section of her final paper in which she discusses the significance of her findings (“how the crops will benefit others”), Ruth includes a quotation: “If motherhood propels you into adulthood, it can also help you rediscover your childhood—and the child within. That’s part of what makes the experience so profound: It transforms you into an utterly different person. And it brings you back to the essence of who you’ve been all along” (Satran, 2004). Ruth explains why she included this quote her study:

Although this quote talks about how you change when you become a mother, I find it significant because it reflects what happens when you ‘put on your oxygen mask first’ before assisting others, when you look at your own learning style in order to help others understand how they learn best ... examining who you are also brings you back to who you are, your inner child, because how you process the world is uniquely you. (5/14/04)

Here, she returns to a theme introduced in her first module writing – that noticing is a tool to apprehend individual uniqueness. Part of that uniqueness is learning style. With this realization in mind, she recalls the behavior of past students and sees them in a different light:

Coming to that understanding allows you to be tolerant of others who do not learn in similar ways. I look back on students who irritated me; students who didn’t find the graphic organizers particularly helpful, those who purposefully skipped around their assignments, those who jumped in almost instantly without thinking things through first. Rather than validating these actions as student attempts to make meaning and to understand material, I interpreted it negatively ... I used to see “black and white” and am now seeing in color. The “color” I see is the multitude of strategies all learners use to make sense and meaning. Acknowledging that there are strategies contrary to ours that may be of greater relevance to some students only happens when the teacher acknowledges his/her own personal biases. It is recognition that those biases ultimately influence approaches to their classroom. (5/14/04)

Through taking the risk to be self-critical rather than self-defensive and self-justifying, Ruth was able to recognize her own biases with positive implications for her future practice. Ruth describes the fundamental nature of the transformation she undertook for herself, the courage required to be self-critical and vulnerable, and the empowerment that can result:

Change begins by knowing oneself. If you don’t assess who you are, there is no foundation upon which to lay improvements. Assessing yourself leaves you vulnerable yet empowered. Your weaknesses are revealed when engaged in self-reflection, yet the uncovering of these links allows you to strengthen them and improve them so they no longer remain weaknesses. In order for any real change to begin, I had to admit my insecurities about communicating in chat, my misgivings about oral learning, and my irritation with learning out of sequence. (5/14/04)
Contrary to what she was taught about being self-sacrificing as both a teacher and a mother, Ruth came to realize that the best way to help others was to first help herself. Understanding her own learning style helped her see that her instructional strategies might be an obstacle to student learning. This expanded frame of reference and new view of herself gave her the ability to “understand that having an arsenal of teaching strategies that match your personal learning style as well as those that are contrary to how you learn allows you to maneuver smoothly between balancing instruction tailored to the learning style of your students while introducing strategies they may need in order to adapt to learning situations that are uncomfortable for them.” Rather than viewing her desire for self-improvement as selfish, Ruth came to see it as essential, never losing sight of her ultimate goal of helping her students become lifelong learners.

I am empowered by the desire to discover more and learn more about how I go about interpreting the world around me ... Change really begins by a desire to improve, but I was fueled by a desire to reach students and “feed” them not just for the day, but also for a lifetime of learning. By examining my learning style, I made a conscious decision to “put on my own oxygen mask.” By putting myself first, I gave myself the gift of self-awareness. Now that I am oxygenated, I am certain that I’ll be able to “fish” for a lifetime, to “feed” the hunger for knowledge and wisdom, even if it means learning to “swim” outside of water. (5/14/04)

Ruth’s final paper gives clear evidence that she engaged deeply in psychological reflection, examining her activities and experiences as a mentor, mentee, and teacher in order to develop herself as a more effective and sensitive teacher in the future.

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RUTH’S FINAL COURSE COMMENTS

Ranking of Course Activities

At her final interview on June 12 in my office in the university library, Ruth first filled out a questionnaire (see Appendix G) and then discussed her final thoughts about the course. When asked on the questionnaire to rank the course activities in order of importance to her learning progress during the semester, she ranked journals as the most important (see Chart 16). Not only did she submit regular journals for class, but she also kept an “intimate journal” as part of the data collection for her research project. This journal was not shared, but presumably Ruth considered it for the ranking.
Chart 16. Ruth: Importance of Course Activities for Learning

<table>
<thead>
<tr>
<th>Rank</th>
<th>Course Activity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Journals</td>
<td>Provided roadmap of how I’ve changed and what I’ve learned; valuable “glue” that cemented what I’ve learned.</td>
</tr>
<tr>
<td>2</td>
<td>Other: Face-to-face meetings with Sarah and Joyce</td>
<td>F2F meetings with Sarah and Joyce helped me remain on track; easier to ask questions in person and gain immediate feedback.</td>
</tr>
<tr>
<td>3</td>
<td>Email with instructor</td>
<td>Helped me to clarify questions; prompt responses were helpful in alleviating anxiety of not knowing.</td>
</tr>
<tr>
<td>4</td>
<td>Telementoring your mentee</td>
<td>Able to form casual relationship with mentee; allowed me to see how important building a relationship with student is for learning (both mentee and teacher).</td>
</tr>
<tr>
<td>5</td>
<td>Writing your weekly module assignments</td>
<td>I liked reading Sarah’s responses to the same question. It gave me an appreciation of how experiences shape future action.</td>
</tr>
<tr>
<td>6</td>
<td>Research project</td>
<td>Challenging, but opened my eyes to the power of reflection; also helped me understand the difficulty and complexity of AR.</td>
</tr>
<tr>
<td>7</td>
<td>Weekly assigned readings</td>
<td>Helped me to focus on module questions; gave different perspectives on similar issues; like reading comments on my responses.</td>
</tr>
<tr>
<td>8</td>
<td>Independent readings for your research project</td>
<td>Made me realize the abundance of information leads to selecting &amp; deselecting &amp; refining topic; important to research process.</td>
</tr>
<tr>
<td>9</td>
<td>Chat</td>
<td>Difficult for me to sit still between responses; felt pressure to answer quickly.</td>
</tr>
</tbody>
</table>

**Most Important Learning: Reflection**

When asked on the questionnaire (6/12/04) about the single most important thing she had learned during the semester had been, Ruth wrote that her most important learning was that “Reflection is the heart and soul of real learning.” Her five most important discoveries (in rank order) were: “(1) AR is a complex living thing that gets shaped as the research process continues. (2) AR is an ongoing experience; there is really no beginning or end. (3) The only way to help others is by knowing how you learn. (4) When you hit a brick wall, pick yourself up and find a way over it, under it, or around it. (5) All research is subjective, no matter how hard they try to convince you that it’s 100% objective.” When asked on the final questionnaire if and how her experiences during the semester had changed her perception of herself, she responded: “I see every experience positive or negative as a learning opportunity. I now see myself as a vehicle to help others ‘see’ reflection as an important part of being and becoming ‘human.’” When asked on the final questionnaire if and how her experiences during the semester had changed her perception of “the world,” she responded: “I see conflicts with others and problems with students as opportunities to make things
better.” It seems that Ruth faced such conflicts and problems during the semester and successfully managed them using her heightened powers of awareness and reflection.

**Learning from Readings and Modules**

In the final questionnaire (6/12/04), Ruth was asked to rate the course readings according meaningfulness, difficulty, helpfulness, and resonance with personal experience. Mason was included among the most meaningful readings, as well as those that resonated best with her experiences. The readings she found most difficult to understand were the Strauss & Corbin (1998) chapters on grounded theory coding, as she felt they were technical in nature and she needed more time to absorb and apply them. The least helpful readings were those on data analysis and management (Merriam, 2001). She appreciated “how there was a wide selection of readings to choose from that represented various angles on related issues.”

In general, her answers highlight the following themes: (1) the value of reflection for knowing yourself and improving your interactions with others; (2) the value of teacher research to impact your own learning as well as student learning; (3) the importance of doing action research despite the difficulty; and (4) the importance of being able to “control your own destiny” by changing your view of yourself. The answers reinforce Ruth’s statement in her final report that she had mistakenly neglected her own self-development and was able to use the course as an opportunity to remedy that. Her answers also support the conclusion that Ruth attained greater self-confidence and a higher degree of perceived self-efficacy due to her ability to successfully complete a complex and challenging research project.

In the final questionnaire (6/12/04), Ruth was asked to rate the course modules according to the following questions: “(1) In which modules did you feel you made the best progress in learning this semester? Please describe why you chose each module to answer this question. (2) In which modules did you feel you made the least progress in learning this semester? Please describe why you chose each module to answer this question.” Her comments support the conclusion that a heightened awareness of people, events, and situations, combined with a skillful use of reflection, had a major impact on her sense of self-efficacy. Ruth’s written answers are summarized in Chart 17.
**Chart 17. Ruth: Evaluation of Modules**

<table>
<thead>
<tr>
<th>Category</th>
<th>Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modules in which you feel you made the most progress</strong></td>
<td>M1 “Noticing as Inquiry.” This module has made the biggest impact on how I view obstacles and problems around me. By focusing on reflection and by “noticing” things around me, I view problems as opportunities rather than as obstacles.</td>
</tr>
<tr>
<td></td>
<td>M3 “Research Methods.” Previous to this I had very limited knowledge of selecting research methods that best fit the research question. Although I still have a lot more to learn, I now have at least a grasp on research methods available.</td>
</tr>
<tr>
<td><strong>Modules in which you feel you made least progress</strong></td>
<td>M9 “Claims and Warrants.” I’m still unclear with this module area. I’m weary of how a claim can be stated clearly.</td>
</tr>
<tr>
<td><strong>Other comments</strong></td>
<td>Modules followed logical progression. Due to my need for more time to process information, I often felt my own research fell behind the timeline of the modules.</td>
</tr>
</tbody>
</table>

**Telementoring a High School Senior**

Though a meaningful mentoring relationship developed between Ruth and Jessica, this did not happen through online communication. The existence of frequent opportunities to see each other and the preference of both Ruth and Jessica to communicate face-to-face rather than online were probably strong factors discouraging telementoring. Kevin O’Neill (2000: iii) has defined telementoring as “using telecommunications technology ... to develop and sustain mentoring relationships where face-to-face ones would be impractical ... in intellectual partnerships that would not otherwise take place.” Clearly, the conditions for telementoring were not in place in the case of Ruth and Jessica.

Ruth mentioned in her final paper (5/14/04) that she had decided against using chat with Jessica because she “had made the dangerous assumption that if it would make me uncomfortable, then it would be an ineffective strategy to use with someone else.” She also stated that, “when given the option to either gain information from student J in person or communicate via e-mail, I chose to communicate in person.” Whether Jessica would have increased her own online communication with more encouragement from Ruth remains an open question. It should be noted that the conditions for telementoring set by O’Neill were met during the fall of 2003, when Jessica was being telementored by Linda. From the beginning of September to end of December, Linda sent Jessica 19 messages with a total of 3,350 words. Jessica sent Linda 12 email messages with a total of 905 words. This was actually less than the total number of messages (14)
and volume of words (1,141) that Jessica sent to Ruth while being able to meet her face-to-face. Ruth’s reasons for being uncomfortable with email have been noted by others (as discussed in Chapter 2):

What made email less appealing to me was the gaps in responses from the person you’re communicating with. I examined why the gaps made me uncomfortable as a learner. I often found that with email, conversations that would have taken 10 minutes ended up being spread over days. In particular, with email I found myself trapped between trying to actively “read between the lines” versus allowing my instincts to dictate the message … Rather than “reading between the lines,” I “cheated” by confirming responses via telephone or by talking briefly in person with student J. It was “cheating” in the sense that rather than expanding my repertoire of teaching strategies, I purposefully continued to rely on strategies I was already using. (5/14/04)

It seems logical to conclude that while O’Neill’s definition points out the necessary conditions for telementoring to occur, other factors such as learning style or level of writing skills may heavily influence the success of a given telementoring effort.

**Online Communication and Learning**

Linda had originally approached Ruth with a request that she take over as telementor to Jessica. In her final interview (6/12/04), Ruth made clear that ability to participate in an online course from home was a deciding factor in agreeing to become a telementor and join the action research course: “Had it been all face-to-face, I probably would have said ‘no’ to Linda. Because I could check it on my own time. And knowing Jess I think helped too. And I knew that she’s such a good student, she’s very motivated. You can’t say ‘no’ to that, you know.” In spite of this, at the end of the course Ruth ranked face-to-face interactions higher in importance for her learning than either email or chat. In her final interview, she stated that “the face-to-face once a month … kept me on track … because there are some things that you can work out face-to-face better.”

When asked on the final questionnaire (6/12/04) how online communication benefited her most, her answer was, “Having a log of emails allowed me to ‘see’ how I was communicating with Jess. Having a supportive chat group let me express my opinions freely.” Ruth’s other comments on chat were enlightening. When comparing the action research course with her previous chat experiences in an educational technology course, she noted in her journal entry of April 18:

What works in the telementoring chat is not only the size of the group, but more importantly there is a common set of readings (background, authors, philosophy) that serve as the backdrop so that we can bring our different experiences to the table. Being a picture person who needs to “see” what’s happening, what I’ve tried to do to accommodate this is to write down key comments or ideas that
emerge from the chat. I may doodle, draw a picture, a metaphor of a key idea, while I wait for responses. I am also a reflector who takes in data but needs time to process. I often find giving an answer on demand difficult, as I need to hear it out, revise it, think about it again and then share it. I often write a message, erase it, write it again, erase it ... the discussion has already moved on ... so I erase it. No one knows all of the drafts I had to go through, but it really comes down to my need to process through. (4/18/04)

As noted in the earlier discussion of Ruth’s final paper, another reason she found chat difficult was the lack of immediate, visual, affective feedback. She wanted reassurance that she had been understood through smiles and enthusiastic nods. Not knowing made her uncomfortable and anxious: “When responses from other chatters took longer than I had anticipated, I often jumped to the conclusion that they either didn’t understand what I was trying to say or didn’t agree” (5/14/04). Even among a small group of participants with a common professional culture and a desire to support and collaborate with each other, online media can engender anxiety, discomfort, and misinterpretation. On the other hand, the distance offered by the online media can sometimes be an advantage, as Ruth also noted on her final questionnaire: “When distance is involved (physical or emotional), online communication allows you to continue to dialogue” (6/12/04).

The use of the wiki seems to have been beneficial for Ruth in the end. The wiki was designed to be easy to use by novices, and Ruth confirmed this to be true: “Learning how to use the wiki was probably the easiest thing, though, because I found that pretty straightforward” (6/12/04). She had more difficulty dealing with the changes made as the course progressed. Because it was designed to cater to individual learning needs as the research projects progressed, the modules and readings were originally skeletal and were fleshed out and revised as the students’ research progressed. As noted previously, in her final paper Ruth described her difficulties with the flexibility of the wiki that easily allowed format changes. As a sequential learner, she had expected the information to remain static. However, in her final interview, she also commented,

As far as the comment on the wiki, it was really, really good. It was uncluttered. It was organized. Everything was there. The readings were good. The writing that we did. I like reading Sarah’s comments. You did a really good job of adapting the format as we went along. So it was changing. It wasn’t that you just threw out everything and started all over. I could see that you were really trying to make the learning happen, to make it as easy as possible. (6/12/04)
Were the difficulties she described in her final paper a response to the wiki before it was reorganized? Or, in the process of writing her final paper, did she change her perspective and view the changes more favorably? These are possible interpretations of her contrasting statements.

**Instructor**

On the final questionnaire (6/12/04), Ruth was asked to assess the effects of the instructor’s actions on her learning during the semester (see Chart 18). The fact that Ruth filled out the questionnaire in the instructor’s presence should be considered when weighing her answers.

### Chart 18. Ruth: Evaluation of Instructor

<table>
<thead>
<tr>
<th>Question</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>What things did the instructor do that were most helpful to your learning?</td>
<td>Responded quickly to comments, questions, and concerns. Provided constructive feedback to clarify thoughts and ideas in research proposal and module questions. Provided supportive and risk-free on-line environment (chat, email) that I could freely ask questions without feeling intimidated.</td>
</tr>
<tr>
<td>What things did the instructor do that were least helpful to your learning?</td>
<td>Let me slide at the beginning when I started turning journals in late.</td>
</tr>
<tr>
<td>What could the instructor have done to help you learn better?</td>
<td>Maybe provide additional checkpoints during research process to make sure I was on track. Provide project planner at beginning of process.</td>
</tr>
<tr>
<td>Other comments on the instructor</td>
<td>I liked how the instructor applied feedback that I gave about what helped me learn best, throughout the course rather than just at the end. The instructor gave support as process got difficult and provided constructive feedback that helped me make it through this process.</td>
</tr>
</tbody>
</table>

**RESEARCH CASE ANALYSIS**

**Statistical Summary of Course Activity**

Though statistics are only gross indicators of learning activity, they provide an overview of relative volume of activity in different categories and are a useful supplement to the student narratives and self-reports.

**Course Activity**

As shown Table 1, in terms of volume of online activity, Ruth’s course emails, chats, journals, and final paper were approximately the same in numbers of words produced. No single activity stood out. Course email refers to email messages Ruth and the instructor exchanged related to the LIS 699 course. Telementoring email refers to messages Ruth sent to her high school mentee and other adults connected to
the telementoring project, excluding the instructor. Module work refers to assignments and discussion questions done for the weekly modules. Though the research proposal and final paper underwent revisions, only the numbers of words for the final versions are included here.

**Table 1. Ruth: Total Volume of Course Activity**
(In number of words estimated from QSR text units)

<table>
<thead>
<tr>
<th>Ruth’s Course Activity</th>
<th>Words</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>699 Course Email</td>
<td>7,580</td>
<td>20%</td>
</tr>
<tr>
<td>Telementoring Email</td>
<td>4,100</td>
<td>11%</td>
</tr>
<tr>
<td>Chats</td>
<td>6,650</td>
<td>18%</td>
</tr>
<tr>
<td>Journals</td>
<td>6,970</td>
<td>18%</td>
</tr>
<tr>
<td>Module Work</td>
<td>4,690</td>
<td>12%</td>
</tr>
<tr>
<td>Research Proposal</td>
<td>1,080</td>
<td>3%</td>
</tr>
<tr>
<td>Final Paper</td>
<td>6,870</td>
<td>18%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>37,940</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Online Interaction**

As the statistical summaries and Ruth’s final course comments indicate, online interaction did not stand out as particularly important for Ruth’s learning. Table 2 summarizes the content of the email exchanges between Ruth and the instructor, including journal entries. Email and journal entries were combined for this comparison, because these two categories merged when journal topics were subsequently discussed via email. Course business refers to procedural aspects such as scheduling, how to use the online tools, and clarification of assignments. Action research refers to general topics such as impartiality, objectivity, claims and warrants, and ethics not specifically applied to the student’s action research project. Research project refers to issues related specifically to the student’s research project. Telementoring refers to correspondence related to the high school telementoring activity. Personal refers to the sharing of personal activities outside the course.
Table 2. Ruth-Instructor Email/Journal Exchanges by Content  
(In number of words estimated from QSR text units)

<table>
<thead>
<tr>
<th>Email / Journal Content</th>
<th>Ruth to Instructor</th>
<th>Instructor to Ruth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Words</td>
<td>% of Total</td>
</tr>
<tr>
<td>Course business</td>
<td>5,270</td>
<td>36%</td>
</tr>
<tr>
<td>Action research</td>
<td>1,750</td>
<td>12%</td>
</tr>
<tr>
<td>Research project</td>
<td>5,060</td>
<td>35%</td>
</tr>
<tr>
<td>Telementoring</td>
<td>2,370</td>
<td>16%</td>
</tr>
<tr>
<td>Personal</td>
<td>100</td>
<td>1%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,455</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

In total, the instructor wrote more to Ruth than she did to the instructor, approximately 18% more in words. In terms of categories, the exchanges were unequal except for the Personal category, as both individuals exchanged little about themselves online. Ruth sent more words than the instructor did related to general action research issues and her telementoring with her high school student. The instructor sent more to Ruth related to course business and Ruth’s research project. In contrast to her other writings, Ruth’s email messages were generally concise and businesslike in manner.

**Ruth’s Most Significant Learning Sub-Narrative**

Within the primary narrative of learning action research, Ruth’s most significant learning sub-narrative was changing a habit of mind about herself as a teacher. Her statements indicate that she was highly motivated to help “weaker” others in her life (her students and child). This is part of her professional values. Teaching and librarianship are traditionally service professions. Though it is evolving in the larger societal context of the information age, within the educational context, librarianship remains service-oriented.

One cannot speculate from the data about the pressures, conflicts, and problems Ruth might have been experiencing in her personal or professional life. In an early journal entry (2/3/04), she writes about “self-doubt and [the] need to constantly justify one’s actions,” and in her final paper (5/14/04) she mentions self-sacrifice. She seems to have had a deep need to “replenish” herself, even to the extent of changing her life. In her first module writing (1/21/04), she twice uses the phrase “life-changing” in connection with Mason’s view of reflection. She calls reflection a “life-changing tool” that is only effective if “put into life-changing
actions by the reflector.” Mason himself does not use the phrase “life-changing” in the reading for the module, although his discussions of “psychological reflection” clearly indicate that its use can result in significant self-change.

The first of Ruth’s findings in her final paper (“Crop #1”) is that “predictions help you understand who you can become” (5/14/04). The meaning of her statement is not obvious. The key word seems to be “become.” This points to Ruth’s process of “becoming” during the semester. What was the nature of this process? What did it entail? What changes did she make? And who did she become? Her writings point to changed views about how her learning style had impacted her students, a different idea of the nature of research, and an improved attitude toward online communication. She also came to value her own professional development. She moved from self-doubt to self-confidence and from passive to active agent in her life. Using greater “noticing” powers, she became aware of the need to penetrate through self-doubt, stand up for herself, and nourish herself first before “feeding” others.

Another important goal for Ruth was to be an effective mentor. In her first module writing (1/21/04), she states this in far-reaching terms: “Just as the sun nurtures the seed from a distance, I too will be nurturing Jessica’s growth this semester. I also feel this telementoring project allows me to teach Jessica to ‘fish’ so she can ‘feed’ herself for a lifetime, as opposed to ‘feeding’ her for a day by giving her a ‘fish.’ The ‘fish’ I feel represents the pursuit of lifelong learning and striving towards your goals despite the ‘bumps in the road.’” “Bumps in the road” is a probable reference to some of the challenges Ruth knew Jessica was facing in her personal life. By the end of the semester, Ruth had given herself the gift she had originally envisioned giving to Jessica: “By putting myself first, I gave myself the gift of self-awareness. Now that I am oxygenated, I am certain that I’ll be able to ‘fish’ for a lifetime, to ‘feed’ the hunger for knowledge and wisdom, even if it means learning to ‘swim’ outside of water” (5/14/04).

It seems evident that the turning point was the refocusing of her research topic after meeting with the instructor on April 17. Until then, she had been focusing on the effect of her instructional strategies to accommodate Jessica’s learning style in an online context. She mentioned that up until that point she had no idea about how she was going to finish her research project and paper. As she examined on her own learning style and looked back over the data in her intimate journal recording her experiences as telementor
and telementee, the data caused her to confront negative emotions and reevaluate basic assumptions about herself, as she notes in her final paper: "I had to admit my insecurities about communicating in chat, my misgivings about oral learning, and my irritation with learning out of sequence" (5/14/04). She makes a clear connection to her own teaching: "The need for consistency of the information presented, is a reflection of my desire to keep things 'in order' in sequence. As I reflect on my teaching, I find that I get irritated at students who skip steps to complete projects. Why can't you do #1 first, #2 second I ask them? Their answer to this question is simple: I can't do #1 and then #2 because the order of things doesn't really matter to me; your #1 is different from mine" (5/14/04). Her experience of being accommodated by an instructor with a different learning style is almost certainly one of the consequential events that led to her self re-evaluation. She states that valuing the uniqueness of individuals "allows you to be tolerant of others who do not learn in similar ways" (5/14/04), presumably the instructor as well as her former students. Importantly, she also realized that she needed to take care of her own learning needs first.

Ruth's transformation required the courage to be self-critical and vulnerable, and she was rewarded with self-empowerment. According to Mezirow's transformative learning theory (2000: 19), learning occurs through one of four types of transformation: by elaborating existing frames of reference, by learning new frames of reference, by transforming points of view, or by transforming habits of mind. Of these four, transforming one's view of oneself – habits of mind – is the most difficult of all changes to make:

[W]e transform frames of reference – our own and those of others – by becoming critically reflective of their assumptions and aware of their context – the source, nature, and consequences of taken-for-granted beliefs ... We change our point of view by trying on another's point of view. We are unable to do this with a habit of mind. The most personally significant and emotionally exacting transformations involve a critique of previously unexamined premises regarding one's self ('a woman's place is in the home, so I must deny myself a career that I would love'). (Mezirow, 2000: 19-22)

Rejecting the framework that viewed self-sacrifice as the measure of a good teacher and a good mother, Ruth came to realize that the best way to help others was to first help herself. She apparently needed to take this journey from self-doubt to confidence in her ability to meet the unknown, with trust in her reservoir of personal power and wisdom. In an early journal entry, she asked fundamental questions about her identity and values and realized in her final paper that "only by grappling with these questions
can ‘seeing the light’ transform from a passive activity to an active integration of past, present, and future experiences” (5/14/04).

Ruth effectively used the resources at her disposal – her telementoring experiences with Jessica, the course readings and assignments, interactions with the instructor and her fellow student, and the cognitive and emotional challenges of the research process. She drew on her personal strengths as a teacher, mother, and learner. One of her particular strengths as a visual learner was the use of metaphor. Metaphor in the creative arts is essential for making surprising connections that elicit unexpected, deep, and meaningful insights. Ruth’s metaphors helped her draw out deeper understandings, express them, and consider alternatives. As Mezirow (2002: 20) notes, “Imagination is central to understanding the unknown; it is the way we examine alternative interpretations of our experience by ‘trying on’ another’s point of view. The more reflective and open we are to the perspectives of others, the richer our imagination of alternative contexts for understanding will be.”

The narrative plot of how Ruth changed her view of herself is in essence seven key features of reflection: (1) being confronted with a challenging question or situation – confronting evidence that she was biased toward visual learners; (2) dealing with feelings/emotions related to the challenge – dealing with irritation with previous students and her action research course instructor; feeling valued as a learner in the action research course; feeling vulnerable facing her weaknesses; desiring self-growth and empowerment; (3) bringing experience into the thinking/reflecting process – reflectively examining her thoughts, feelings, and behavior as a teacher, mentor, and mentee; (4) reframing perspective through bridging the concrete and the abstract – using concrete evidence and metaphors to understand that her view of herself as a good teacher who accommodated diverse learners was inaccurate; (5) making a leap of thinking – redefining good teacher to include the importance of self-awareness, reflection, and professional development; (6) integrating the new knowledge cognitively and affectively – confirming that she had the personal power, wisdom, and confidence to continue learning, growing, and becoming a good teacher as she had redefined it; (7) with implications for future action – with plans for teaching to diverse learners while introducing them to new strategies to cope with a wide range of learning situations. The turning point
in this narrative is making a leap of thinking, which indicates a learning transformation. This is highlighted
in the following chart summarizing the narrative.

**Chart 19. Ruth: Summary of Reflection Sub-Narrative**

<table>
<thead>
<tr>
<th>Seven Key Features of Reflection</th>
<th>Ruth’s Story of Self-Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being confronted with a</td>
<td>Confronted evidence of her</td>
</tr>
<tr>
<td>challenging question or situation</td>
<td>bias in favor of visual</td>
</tr>
<tr>
<td>Dealing with feelings/emotions</td>
<td>Irritated with past students</td>
</tr>
<tr>
<td>related to the challenge</td>
<td>and action research</td>
</tr>
<tr>
<td>Bringing experience into the</td>
<td>instructor, felt valued</td>
</tr>
<tr>
<td>thinking/reflecting process</td>
<td>as a learner in the action</td>
</tr>
<tr>
<td>Reframing perspective through</td>
<td>research course, felt</td>
</tr>
<tr>
<td>bridging the concrete and the</td>
<td>vulnerable facing her</td>
</tr>
<tr>
<td>abstract</td>
<td>weaknesses, desired self-</td>
</tr>
<tr>
<td>Making a leap of thinking</td>
<td>growth and empowerment</td>
</tr>
<tr>
<td>Integrating the new knowledge</td>
<td>Used evidence and metaphors</td>
</tr>
<tr>
<td>cognitively and affectively</td>
<td>to understand that her view</td>
</tr>
<tr>
<td>With implications for future</td>
<td>of herself as a good teacher</td>
</tr>
<tr>
<td>action</td>
<td>who accommodated diverse</td>
</tr>
<tr>
<td></td>
<td>learners was inaccurate</td>
</tr>
<tr>
<td></td>
<td>Redefined good teacher to</td>
</tr>
<tr>
<td></td>
<td>include the importance of</td>
</tr>
<tr>
<td></td>
<td>self-awareness, reflection,</td>
</tr>
<tr>
<td></td>
<td>and professional development</td>
</tr>
<tr>
<td></td>
<td>Confirmed that she had the</td>
</tr>
<tr>
<td></td>
<td>personal power, wisdom, and</td>
</tr>
<tr>
<td></td>
<td>confidence to continue</td>
</tr>
<tr>
<td></td>
<td>learning, growing, and</td>
</tr>
<tr>
<td></td>
<td>becoming a good teacher as</td>
</tr>
<tr>
<td></td>
<td>she had redefined it</td>
</tr>
<tr>
<td></td>
<td>Planned to teach with</td>
</tr>
<tr>
<td></td>
<td>multiple strategies while</td>
</tr>
<tr>
<td></td>
<td>introducing students to</td>
</tr>
<tr>
<td></td>
<td>new strategies to cope with</td>
</tr>
<tr>
<td></td>
<td>a wide range of learning</td>
</tr>
<tr>
<td></td>
<td>situations</td>
</tr>
</tbody>
</table>

According to transformative learning theory, learning occurs through four types of transformation:
elaborating existing frames of reference, learning new frames of reference, transforming points of view, or
transforming habits of mind. Ruth experienced all four. As well as changing a habit of mind about herself
as a teacher, she elaborated her existing view of research by realizing that research is a never-ending,
complex, and constantly evolving process. She learned new frames of reference, the most important of
which occurred through her awakening to a deeply self-aware use of reflection that is the heart and soul of
real learning. She also changed her point of view about online learning from negative to positive. Finally,
she changed her view of herself to someone capable of meeting challenges and turning them into
opportunities to make things better for herself and others.

**Self-Scaffolding in Reflection: Narratives as Metaphor**

In Ruth’s case, her use of reflection in the course started with the need and the motivation to use it from the
first module. It was inseparable from her “awakening” to awareness of herself and people and events
around her. From the data, it is not possible to make conclusions about how Ruth used reflection before taking the action research course, and what role it played in her life. In her final paper, when discussing her own learning style, she stated that she preferred reflection to action, especially when meeting new situations. She stated that her most important learning during the semester was that reflection was the heart and soul of “real” learning. This suggests that at least she became more aware of the important role it played in her learning. She indicates in her final paper that this was a new awareness: “Although I am still ‘squinting’ from the sudden brightness that has emerged in front of me; only through constant reflection of my teaching will I be able to adjust to the brightness of the ‘light’ otherwise known as self-discovery” (5/14/04).

Her journal was a key tool. Journaling was ranked as the most important course activity for her learning during the semester; it provided her with a roadmap of how she had changed and cemented her learning. “As I compared my original self-assessment of my learning style with the changes I’ve documented in my on-going journal, I’ve come to the realization that my preconceptions of how I learned limited the kinds of teaching strategies I used, particularly on-line” (5/14/04).

As instructor, I saw the journal entries she submitted as part of her regular class activities but I did not see the “intimate journal” she maintained to collect data for her research project. The analysis process and the conclusions she drew from it are described in her final paper, which can be likened to her reading of the story told in her intimate journal. In her final paper, she attends to the seven key features of reflection in her own words. The affective dimension of this process is discussed more fully later.

As a visual learner, Ruth used metaphors as a means to understand action research. Metaphors were the scaffolds she used to move from the concrete and familiar to abstract concepts. Two examples quoted previously are making a connection to impartiality while in the process of cleaning out her kitchen cabinet and coming to understand the importance of data triangulation while watching her son sleep peacefully with his security collection of blanket, duck, and stuffed Snoopy. In both examples, concrete images and experiences from her daily life were the metaphors she used to understand the abstract concepts of impartiality and triangulation.
Two important characteristics of these examples are the affective and narrative qualities of the metaphors. Affect in the first consists of a movement from frustration, uncertainty, and self-doubt to satisfaction and self-confidence. The frustration she felt in trying to find utensils in her cluttered kitchen cabinet apparently triggered a connection to related feelings she was experiencing in trying to understand impartiality. As she took action to create physical order, she simultaneously created mental order of her disjunct thoughts related to subjectivity and impartiality. The change in narrative situation from clutter to order in her kitchen paralleled her learning transformation from disparate thoughts to a clear, logical understanding of why self-justification is an obstacle to impartiality:

> Without the clutter of things that didn’t belong there and by ordering the things that should belong there, finally I was easily able to find what I needed. It felt great to be able to open the drawer with confidence that what I needed to find, would be there. I feel the same applies to impartiality when you unclutter it. If you are able to suppress the need to “account for” or “justify” your actions, what is revealed is a deeper understanding of what happened and a confidence that emerges that reveals the truth behind the layer of self-doubt and need to constantly justify one’s actions. (2/3/04)

Affect, behavior, and cognition are inseparably merged in a multi-layered narrative process. Affect is the impetus for physical action and the impetus for cognitive clarification, preceding it, accompanying it, and confirming the resolution to a new state of understanding.

In the second example of how Ruth gained a better understanding of triangulation, the short passage contains an interrelated set of small narratives. The plot of the first is simple: Ruth’s son could not sleep at night until he had added two new items to his security collection (consequential event). Then he was able to sleep better (change in narrative situation). This parallels the plot of a second story. Additions to another collection – methods of data collection – allow the researcher to feel more secure (and presumably sleep better). The third plot relates these two to Ruth’s learning transformation: by using the metaphor of her son’s security collection, she achieves a more complete and deeply felt understanding of the concept of triangulation tied to feelings of security.

Ruth’s most significant and extensive use of metaphor to scaffold her thinking was the garden metaphor that organized her final paper (5/14/04), entitled “The Harvest of Self-Discovery.” She used a unifying metaphor of plowing, planting, and harvesting a spring crop to represent the research process. This somewhat unorthodox and creative method of presenting her research results allowed her to think and express herself more clearly. In the box below, the headings, subheadings, and explanatory text using the
The headings and text have an unfinished quality, perhaps because Ruth did not have time to polish the paper by the due date. This has the advantage of allowing the reader to speculate about Ruth’s thinking process. The first two chapter headings follow a consistent format: standard research report title, followed by bracketed subheading from the garden metaphor and then explanatory text that explains the research process in terms of the metaphor. Chapter 3 lacks a metaphoric subheading, and the explanatory text is writing in progress. It is grammatically flawed, and the last sentence is incomplete. This suggests that this was the last chapter Ruth revised, if not wrote. Chapter 4 on findings includes the metaphoric subheading in

Chart 20. Ruth: Garden Metaphor of Final Paper

<table>
<thead>
<tr>
<th>Chapter 1: Introduction and Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Preparation of Soil]</td>
</tr>
<tr>
<td>How you prepare your seeds for planting is very important. It is important to set precedence for how the seeds will be planted and tended to. Soil preparation is particularly important because it will provide the nutrients from which the seeds will use to grow. The introduction and background of the study is the “soil” in which I planted my seeds of self discovery about my own learning style. It kept me grounded as I began my research and was my anchor as I dove further into analyzing the data I was collecting.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 2: Review of the Related Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Plowing of Field]</td>
</tr>
<tr>
<td>Plowing the field allows you to delve deep into “studies” that have come before you. Just as the plow mixes and intermingles the soil at the “surface” from the soil way beneath, review of related literature also attempts to intermingle the current study with studies that have come before it.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 3: Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe how will the seeds be planted? Why were the seeds planted that way? What time considerations were made? Describe how</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvesting the Crops</td>
</tr>
<tr>
<td>Harvesting the “crops” will lead to an unearthing of various truths and ahas. More importantly, all of the hard work will soon pay off and will lead to a new cycle of planting.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1. Interpretation of the data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop #1 Predictions help you understand who you can become</td>
</tr>
<tr>
<td>Crop #2 Know yourself, understand others</td>
</tr>
<tr>
<td>Crop #3 Test Wiseness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. The significance of your findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>How the crops will benefit others</td>
</tr>
</tbody>
</table>

metaphor are presented as found in the paper Chart 20; see Appendix J for the complete outline of the paper).
bold font, but lacks the standard report heading. This suggests that Ruth may have written her drafts using
the garden metaphor and added the standard headings later.

The metaphor has narrative characteristics: temporal ordering, Ruth as the implicit actor/gardener, and
a change in the narrative situation from seed to crop due to the gardener’s actions. The story continues into
the future, with new cycles of planting by the gardener and benefits of the crops to others. The affective
qualities of the narrative can be seen by contrasting the standard headings with the metaphoric ones. The
background of the study was the nutritious soil that kept Ruth grounded and anchored as she faced the
uncertainties of the research process. The research process was hard work that paid off. The standard
headings, “Methodology” and “Findings,” perhaps did not seem to provide Ruth with a place to express her
feelings of struggle and gratification.

Throughout the semester, Ruth used metaphor as a means to express new understandings, tap tacit
knowledge, and briefly and effectively hint at fullness, depth, and richness of meaning. Mason (2002: 78)
states that “metaphor … is structural, deep, and meaningful.” Perry and Cooper (2001: 44) suggest that
metaphors can: (1) “Provide a context from which we can make sense of the world. The ‘seeing as 1/4’
nature of metaphor often allows us to think more easily about a particular concept.” (2) “Bring about a
richer understanding of a concept by its ability to remark on features of similarity that were previously
unrecognised. Metaphors allow us to re-organise our understanding of a particular concept because
properties of that concept have taken on, through the metaphor, features that had previously not been
noticeable or obvious.” (3) “Identify something that has previously been unnamed and as such provide us
with a way of learning something new about the way in which we perceive or understand our
environment.”

Cheryl Hunt (2001) uses metaphor to facilitate reflective practice, a means that Ruth seems also to
have discovered. Hunt describes herself as a visual thinker, similar to Ruth’s description of herself in her
final paper as a visual learner. In describing how she uses metaphor as a thinking tool, Hunt sheds light on
Ruth’s frequent use of metaphors in her writings (2001: 276):

One of the things I have gained personally from deliberately engaging in reflective practices is a
better (but still developing) understanding of how I represent the world to myself; an understanding,
in effect, of my own thinking processes. I am now acutely aware that I think in pictures: in order to
make sense of something, I have first to ‘see’ it. To give a fairly prosaic example, if someone tells me
how to get from A to B, I do not store that information in verbal form: I do not continue to 'hear' the instructions as I follow them; I 'translate' them, instead, into visual images ... I find that metaphors provide a particularly useful way of seeing the familiar differently and, hence, of responding to the familiar in different ways. In addition, they often help me to give shape to things that I sense but cannot yet adequately describe ... the use of metaphors certainly enables me to transfer feelings into a space beyond my personal 'gut reactions' where I can then begin to explore, explain, and sometimes share them.

Reflection can be seen as a dialogue between one's active self and reflective self. As a visual learner, Ruth appears to have used metaphors as self-scaffolding to move from the familiar thoughts and feelings associated with the daily life of her active self toward new understandings grasped by her reflective self. Ruth was apparently aware of these two selves at work; in Module 12 (4/13/04), she states, “Although difficult, self-observation is a useful evaluation tool. In my opinion, it's like an 'outer-body' experience.”

In The Reflective Practitioner, Schon (1983: 76-104) describes a somewhat similar process using architectural drawings and calls this “design as a reflective conversation with the situation.” The designer shapes a visual representation of the situation, the situation “talks back” with intended and unintended consequences as the design is implemented, and the designer reflects on the resulting problems. The metaphor and the architectural design are a means of taking first steps to grasp a complex situation, followed by further refinements. This is also related to Vygotsky's concept of private speech when an individual internalizes what has been learned in social context, interacting with others.

**Affective Dimension**

One of the key features of reflection is dealing with feelings/emotions related to a challenging issue or problem that one is attempting to resolve. Though stated as a separate feature among the seven key features of reflection, it is in fact involved in all the stages of the reflection process. As Boud et al. (1985b: 11) note, “the reflective process is a complex one in which both feelings and cognition are closely related and interactive. Negative feelings, particularly about oneself, can form major barriers to learning ... Positive feelings and emotions can greatly enhance the learning process.” Because this is not often recognized in models of reflection, Boud et al. (1985a: 29-30) include “attending to feelings” as a necessary part of the process.

Confronting a challenging situation and bringing experiences to bear on one’s thinking may be accompanied by fear or defensiveness if the situation is particularly challenging or the memories of prior
experiences are heavily laden with negative emotion. One needs to remove obstructing feelings in order to move to a rational consideration of events. This is related to Bandura’s concept of affective self-regulation. Ruth describes in her final paper (5/14/04) how she did precisely that: “In order for any real change to begin, I had to admit my insecurities about communicating in chat, my misgivings about oral learning, and my irritation with learning out of sequence.”

Self-change is risky and requires some courage to undertake. In her final paper (5/14/04), Ruth states, “Change begins by knowing oneself. If you don’t assess who you are, there is no foundation upon which to lay improvements. Assessing yourself leaves you vulnerable yet empowered. Your weaknesses are revealed when engaged in self-reflection, yet the uncovering of these links allows you to strengthen them and improve them so they no longer remain weaknesses.”

Risk-taking is a difficult option for anyone to recommend to another, yet it is the willingness to take risks that offers the greatest potential for changes in frames of reference, higher levels of perceived self-efficacy, and greater self-empowerment. The learning environment should support such risk-taking, but not require it. For this to be a genuinely free choice, students and teachers should be involved in relationships that are characterized by honesty, responsiveness, relevance, respect, openness, and empowerment (Paloff and Pratt, 2004: 160-163). Risk-taking requires a supportive environment in which co-learners (including the instructor) provide each other with encouragement, validation, and appropriate challenge. At the beginning, Ruth was uncomfortable with online media, but the environment created by all three participants in the course provided an environment conducive for Ruth to take risks. As noted in an earlier section, Ruth commented that the instructor had built “a caring and nonjudgmental relationship” with her throughout the semester, and in the final questionnaire, Ruth stated that the instructor had “[p]rovided supportive and risk-free on-line environment (chat, email) that I could freely ask questions without feeling intimidated” (6/12/04).

Ruth’s research project had sent her “hurtling down the hill.” By taking the risk to critically examine basic assumptions about herself, she was rewarded with a higher sense of self-efficacy, knowing that she would be stronger and more able to deal with similar situations in the future.
Co-reflection is a collaboratively undertaken reflective process, defined as the “intellectual and affective
activities in which two or more individuals collaboratively engage to explore their experiences in order to
lead to new intersubjective understandings and appreciations.” Co-reflection is part of the process of co-
constructing knowledge through interactions. Co-reflection uses some or all of the seven key features of
reflection.

One narrative involving co-reflection between Ruth and the instructor has been presented – the
exchanges related to initially focusing her research topic. This narrative is characterized largely by Van
Manen’s technical reflection, as the goal was to examine skills, strategies, and methods used to reach the
predetermined goal of researching some aspect of Ruth’s telementoring activities with Jessica. This is
similar to Wells’ view of dialogic inquiry: the instructor scaffolded dialogic inquiry so that Ruth could
achieve a higher level of understanding about action research. Though not described in detail, a second
narrative of co-reflection occurred near the end of the semester when Ruth refocused her research after co-
reflecting face-to-face with the instructor. This narrative is characterized by Van Manen’s practical
reflection, as it was focused on the methods to reach the research goal and also on examining the goal itself.

Ruth and the instructor addressed two other central and integrally related issues in their co-reflections
– the nature of action research and the influence of learning style differences on teaching and learning. The
course readings presented a range of approaches to action research, from Mason’s discipline of noticing
based on psychological reflection to quantitative action research based on technical reflection (Glanz,
2003). As instructor, my belief in the importance of self-awareness and reflection led me to introduce these
concepts and practices in the first module of the course. My aim was to prepare the students to better
understand insider research. Ruth responded with an apparent awakening to the importance of reflection
that resonates throughout her module writings, journal entries, final paper, and final course comments.

Ruth’s original research plan proposed identifying Jessica’s learning style, selecting and implementing
three online interventions to accommodate this, and observing Jessica’s response. Ruth’s final research was
a probing examination of herself as a teacher that was in part engendered by the clash of student-instructor
learning style differences.
From opposite ends of the learning style spectrum, Ruth and I achieved a similar, surprising awakening to our biases as teachers. She was the catalyst for my confrontation with learning style differences. Her request for some small accommodations to her as a visual learner sparked a reexamination of my instructional strategies and led me to reframe my perspective by trying to understand hers, with the accompanying emotions of surprise, chagrin, and empathy for her struggles. We did not discuss this directly. My realization resulted in action — revisions to the wiki site that communicated respect, understanding, and concern. Ruth noted the affective and cognitive effects of the site changes:

By allowing students to learn through methods they are comfortable with, we acknowledge that how they learn is important. I experienced this firsthand as a telementee, as additional visual material was added to the instructional Web page. It allowed me to 'see' the research process through the addition of charts, diagrams, and a metaphor. It affected me cognitively and emotionally. I now not only had a mental picture that I could refer to, but the feeling of being acknowledged transformed into increased motivation and a desire to learn more. (5/14/04)

In her final paper, Ruth articulated thoughts and feelings similar to those I had experienced, but more precisely and completely than I had, leading me to new understandings and appreciations of my own experience:

Coming to that understanding [of the unique ways in which we process the world] allows you to be tolerant of others who do not learn in similar ways. I look back on students who irritated me; students who didn’t find the graphic organizers particularly helpful, those who purposefully skipped around their assignments, those who jumped in almost instantly without thinking things through first. Rather than validating these actions as student attempts to make meaning and to understand material, I interpreted it negatively … I used to see “black and white” and am now seeing in color. The “color” I see is the multitude of strategies all learners use to make sense and meaning. Acknowledging that there are strategies contrary to ours that may be of greater relevance to some students only happens when the teacher acknowledges his/her own personal biases. It is recognition that those biases ultimately influence approaches to their classroom. (5/14/04)

These thoughts particularly moved me as I read them. I recalled occasionally feeling irritated that Ruth did not seem to be spending as much time using the wiki as Sarah or interacting online with me as instructor as much. I remembered how she had opened my eyes to the ad hoc way the wiki had developed, the excessive wordiness of the pages, and the difficulty of navigating the pages if one does not have a clear, strong mental representation of the content of the site — of the nature and processes of action research. I was grateful to her for helping me to also begin to “see in color” and value how another’s perspective could lead me to reexamine myself as instructor and make much-needed changes to improve.
Without words, there is no dialogue. Without dialogue, is there no co-reflection? The definition of co-reflection proposed earlier was “the intellectual and affective activities in which two or more individuals collaboratively engage to explore their experiences in order to lead to new intersubjective understandings and appreciations.” This definition presumes an intention to co-reflect that was lacking in the interactions just described; therefore, to call this co-reflection may be untenable. Yet, the result was a common experience of self-examination, change in self-view, and intention to change our teaching practices that resulted from our interactions – partly verbal, but also behavioral and emotional. Can this be called an intersubjective understanding? This is still an open question.

In other ways, Ruth and I achieved common understandings through means that were tacit and indirect. To provide Ruth with more visual representations of the research process, I posted several graphic models of action research, including Figure 1, “McKernan’s Time-Process Model of Action Research,” in Chapter 2. I also posted two verbal descriptions of the stages of the research process in the form of tables. The first was written in discourse typical of textbook descriptions of the research process (see Chart 21).

**Chart 21. Action Research as Inquiry**

<table>
<thead>
<tr>
<th>Research Stage</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wonder</td>
<td>Consider an issue, problem, dilemma or question related to teaching or professional life; relate the issue to one's own experiences, knowledge, and values.</td>
</tr>
<tr>
<td>Explore</td>
<td>To gain greater understanding and clarity, explore background information, disciplinary knowledge, the practices of others, prior research, research methods, research stances.</td>
</tr>
<tr>
<td>Focus</td>
<td>Focus on a specific issue, problem, or question of strong personal interest; hypothesize; ask other questions to guide investigation; choose methods, data collection and analysis tools.</td>
</tr>
<tr>
<td>Investigate</td>
<td>Collect data; reflect on the data to clarify questions and refine subsequent data collection. In qualitative research, collection and analysis occur together, each informing the other.</td>
</tr>
<tr>
<td>Analyze</td>
<td>Order, categorize, analyze, interpret, synthesize, hypothesize, make conclusions about the data.</td>
</tr>
<tr>
<td>Conclude</td>
<td>Prepare to present findings. Select audience. Organize the report; frame findings by connecting to context and literature; describe data sources, collection methods, process, and results of analysis; evaluate strengths, weaknesses, and contributions; summarize; recommend further action or research.</td>
</tr>
<tr>
<td>Share</td>
<td>Share results in a final presentation but also through ongoing collaboration, sharing findings, getting feedback during the process.</td>
</tr>
<tr>
<td>Reflect</td>
<td>Ongoing critical thinking and consideration of alternatives.</td>
</tr>
</tbody>
</table>
The second was a description of the research process as the personal story of a gardener tending a garden of new ideas, infused it with some of my feelings about research as a personally and socially meaningful pursuit (see Appendix I, “Curiosity’s Garden”).

Ruth quickly emailed her response: “I just wanted to send my kudos for the ‘garden’ research process model. This is one that I most identified with. I especially like that it created a mental image of the steps in the research process in a creative, yet effective way ... It’s interesting that in [another] class where we needed to explain our philosophy of librarianship, I actually gave each person in our class soil, a pot, and some sunflower seeds and I ended with ‘Librarians plant the seeds of lifelong learning’” (3/30/04). It does not seem surprising that this was the model she most appreciated, as it has similar affective and narrative characteristics to her metaphors.

Ruth and I both liked to use a garden metaphor for describing things that were deeply important to us. The garden is a metaphor with meaning apparently deeply rooted in Ruth’s life. Jessica is the “seed” Ruth will pour sunshine on from afar, lifelong learning is the seed that librarians plant, and learning style awareness is the seed that blossomed into self-discovery in her final paper. The garden has also been an important metaphor in this instructor’s life. On March 1, before Ruth requested graphic models of the research process, I was inspired to write “Curiosity’s Garden.” I wrote at that time to a friend:

"Teacher’s garden." It came to me when I was listening to a teacher talk on NPR [National Public Radio] about how she felt about teaching kindergartners. Kindergarten is a garden, in which her job is to help the young students blossom. I thought about how teachers need such a garden. They’re so overburdened with standards and assessment and NCLB [federal No Child Left Behind Law], that they don’t have time to stop, reflect, be given nourishment ... I think teachers need a "garden" in which the sole purpose is to give them food, water, sunlight, space, challenge, beauty ... they do so much for others, some of us others should try to do some things for them. (3/1/04)

I argue that the introduction of “Curiosity’s Garden” gave Ruth implicit permission to use this somewhat unorthodox and creative method of presenting her research results, and that this allowed her to think and express herself more clearly. I believe that she would have preferred to do this without the introduction of “Curiosity’s Garden,” based on other instances of her use of a garden metaphor throughout the course, but she may have been reluctant because it was an unusual way to present a research report. Ruth may have even used aspects of Curiosity’s Garden in her own metaphor. Although I argue that “Curiosity’s Garden” gave implicit permission to use a garden metaphor in her final paper, it is certainly possible that Ruth
viewed this instead as implicit instructions to use such a metaphor in her final paper. The explicit guidelines and suggested outline for writing the final report were presented in the wiki page, "Research Reports." This page did not include mention of the garden metaphor.

The metaphor itself seemed to take on a life of its own as a conceptual artifact. The garden and its characteristics became a special shared language to which we both contributed. By the end of the course, "garden" became a one-word reference for the research process that embodied the potential of a new idea, tending, nurturing, growth cycles, maturity, the satisfaction of harvest, and a look to the future. The strength of the metaphor's affective reach is clear when one considers the impact of the term "research methods" versus the metaphor Ruth (in her final paper) and I (in Curiosity's Garden) used for these: "gardening tools." As in the previous example of confronting our biases regarding learning style differences, Ruth and I did not engage in an intentional dialogue about the use of the garden metaphor to represent the research process, yet we achieved a common understanding that I would argue can be called intersubjective because it was built through mutually observed increments and resulted in a view of the research process that I will ever associate first with Ruth. I believe she will do the same. Can this be called the product of a tacit kind of co-reflection? I argue that it can. The features of this Ruth-instructor tacit co-reflection are summarized in Chart 22.

<table>
<thead>
<tr>
<th>Ruth's Contributions: Knowledge of Learning Styles</th>
<th>Instructor's Contributions: Knowledge of Action Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requested graphic representations of the research process to aid in her understanding as a visual learner</td>
<td>Reorganized the wiki to accommodate Ruth's visual learning style, including posting a garden metaphor of the research process</td>
</tr>
<tr>
<td>In final paper, appreciated and elaborated on the garden metaphor of the research process and analyzed herself as a visual learner and teacher</td>
<td>Gained deeper understanding of garden metaphor from Ruth's final paper and of how visual learners use metaphor to scaffold learning cognitively and affectively</td>
</tr>
<tr>
<td>In final paper, closely examined thoughts and feelings related to self-change as a visual learner and teacher</td>
<td>Re-examined thoughts and feelings related to self-change as a verbal learner and teacher through reading Ruth's final paper</td>
</tr>
</tbody>
</table>

The evidence indicates that Ruth is a deep thinker. Because she is a visual learner rather than verbal and prefers to communicate in pictures and vivid metaphors, she wrote succinctly and did not elaborate on
the details of her processes for arriving at conclusions. As instructor and researcher, it has been necessary for me to read both deeply and between the lines. For us, a meeting of minds was a case of "a meeting of metaphors." Metaphors are a tool for thinking that can evoke mental images; this characteristic of the garden metaphor made it an effective bridge for achieving intersubjective understanding between a visual and a verbal learner. Although expressed verbally, metaphors allow the speaker to invoke implicit notions including images and cause the listener/reader to apply existing deep understandings in novel ways. Another key trait of the garden metaphor was that it drew upon affective connotations. Thus, metaphors can be a tool for sharing ideas and feelings about ideas. Metaphors can be a way of co-constructing knowledge and achieving intersubjective understanding that extends beyond verbal description and cognitive processes to connote cultural symbols, practices, and affective dimensions.

Schon (1983: 80-81), in his example of two architects doing design collaboration, presents an interesting parallel:

Drawing and talking are parallel ways of designing, and together make up what I will call the language of designing ... Whether Quist and Petra speak in words or drawings, their utterances refer to spatial images which they try to make congruent with one another. As they become more confident that they have achieved congruence of meaning, their dialogue tends to become elliptical and inscrutable to outsiders.

As a researcher who is a verbal learner, my view of the co-construction of knowledge had been that it developed through language that explicitly describes thoughts, feelings, and actions. I had expected to find "co-constructed knowledge" in the email messages, chat sessions, and wiki pages as the cumulative result of the synergy of verbal interactions. My view of co-constructed knowledge has now expanded to include the underlying structure of a metaphor and the unspoken affect surrounding it.

Because co-reflection is a collaborative process, the teacher who sees herself as a co-learner who guides the co-construction of knowledge is likely to be better able to value co-reflection and pursue her own inquiry learning within the teacher-student relationship. The synergy between relationship building and co-reflection is fueled by mutual respect, trust, and concern. The relationship building between Ruth and the instructor seems to have been accomplished more effectively in the few face-to-face interactions than the more frequent online interactions. Ruth discussed her difficulties with online communication in her initial interview, journal entries, and final paper. It is probable that the mutual expression of respect, trust,
and concern was conveyed most fully without "fear of misinterpretation" only during the face-to-face interactions. Ruth's request for more visual representations of the research process occurred at the third face-to-face class meeting. The crucial refocusing of her research project occurred as a result of a face-to-face meeting with the instructor on April 17. This meeting was apparently critical to her successful learning, as she notes in her final course comments: "The instructor gave support as process got difficult and provided constructive feedback that helped me make it through this process." At the end of the course, Ruth ranked the face-to-face meetings as second in importance for her learning progress, behind journals but above email (ranked third) and chat (ranked ninth).

However, Ruth also valued the affective quality of the online interactions. In her final course comments (6/12/04), she noted that she appreciated that the instructor "responded quickly to comments, questions, and concerns; provided constructive feedback to clarify thoughts and ideas in research proposal and module questions; and provided supportive and risk-free on-line environment (chat, email) that I could freely ask questions without feeling intimidated." The instructor's accommodation of Ruth's learning style was important both cognitively and affectively, as Ruth noted in her final course comments: "I liked how the instructor applied feedback that I gave about what helped me learn best, throughout the course rather than just at the end."

**Role of Online Media in Communication and Learning**

First and foremost, online media enabled the course to be conducted with Ruth as a participant. It is highly likely that had it been face-to-face, Ruth would not have taken part.

For Ruth, online media were both a barrier and a facilitator for communication and learning. After realizing that her discomfort in a previous online course was blocking her ability to use the chat medium effectively, she took a more positive attitude. A supportive learning environment that allowed her to express herself freely also apparently mitigated the difficulties. Her attitude toward the wiki seems to have changed after it was reorganized and new visual material added. This was perhaps influenced by her appreciation of being accommodated as a visual learner. She appreciated being able to review her email messages to Jessica, and also enjoyed reading Sarah's writings, which offered a different perspective on the readings and course content.
Although the text-based wiki was a challenge for Ruth as a visual learner, the act of writing itself encourages reflection and co-reflection. The examples of her writing presented in this chapter are evidence that Ruth is a thoughtful and effective writer who creatively uses metaphors and analogies to make unusual, thought-provoking connections. Sarah mentioned appreciatively in her final interview that she wondered how Ruth was able to think of such metaphors.

Ruth notes that she had expected the online information to remain static, implying that she had expected a complete presentation of the course from the start. This is understandable given her past experiences with structured university courses. University of Hawai‘i online courses generally use WebCT, which does not allow for quick, easy collaboration or student-created web pages. As instructor, I had envisioned co-creating course content and co-developing the wiki with the students, and I invited them regularly at the beginning of the course to freely edit and add new pages as they wished. While the students did add some new pages related to their research projects, they only edited the existing wiki pages when they added pre-assigned content. It is not enough to invite students to freely use a new technology tool, despite its ease of use. Activities requiring the use of the wiki for collaboration were needed. Moreover, the fact that action research, telementoring, and even their own skills as novice librarians were new to them probably made it unreasonable to expect that they could carry additional demands on their time and energy.

Ruth’s difficulties as a visual learner in a textual online environment (email, chat, wiki) raises issues of how to provide better ways for visual learners to communicate visually and graphically. More fundamentally, it points to the need to build the capacity of the learning facilitator to understand visual learning and communicate effectively with visual learners.

EPILOGUE

The action research course offered some tools and the opportunity for Ruth to undertake the risky process of self-change. Her choice to do so may have been the combined result of a need for self-growth; a desire to be a better telementor, teacher, and mother; self-discipline; and the courage to be self-critical. It was encouraged by the experience of mentoring Jessica, an inspiring young woman in need of emotional and cognitive support. It was also encouraged and supported by the other participants in the course who
appreciated, validated, and challenged her appropriately. Ruth saw herself as the "vehicle" to help others and realized that the way to become the best vehicle possible was to first help herself.

She was willing to try and see from the "other's" perspective, valuing the uniqueness of individuals and their special contributions. Ruth focused on reflection and self-growth. She made a major change in her perception of herself and gave herself the gift of self-empowerment. She thought deeply and imaginatively and made effective use of metaphor as a tool for thinking and sharing her ideas. Metaphors not only provided mental images but also engaged feelings tied to the metaphors.

Metaphors focus on essences. Ruth and I had both struggled with the barrier that our learning style differences had created, and a shared metaphor helped us negotiate our differences and build meaning together. Each of us confronted and met the challenge to change our way of viewing the situation, each other, and ourselves. At the end of the final interview, before Ruth walked out the door of my office, we gave each other a big hug.
CHAPTER 6. SARAH: BUILDING VIRTUAL RELATIONSHIPS

PROLOGUE

The aims of the present study are to examine the co-construction of knowledge and how affect and interaction influence participant understanding of action research. The research questions are: (1) What are the key cognitive, affective, and interactional elements of the online conversations? (2) How do student-instructor interactions influence student understanding in the action research course? (3) How do student-instructor interactions influence course development?

This chapter addresses these questions through narrative analysis of Sarah’s learning experiences during the action research course. These are organized as a primary narrative consisting of: (1) Background (orientation), (2) Learning Action Research (beginnings), (3) Planning and Conducting Research (complicating action), (4) Final Paper (result), (5) Sarah’s Final Course Comments (student evaluation), (6) Research Case Analysis (researcher evaluation), and (7) Epilogue that realizes the narrative design of the learning stories constructed individually by Sarah and co-constructed by Sarah and the instructor. The research case analysis identifies Sarah’s most significant learning sub-narrative as well as key themes and issues: the role of reflection, the importance of the affective dimension, co-reflection and the co-construction of knowledge, and the role of online media in communication and learning.

BACKGROUND

Teaching Philosophy and Experience

Sarah Morris was finishing her master’s degree in library and information science while working as a school library media specialist. She had taught secondary language arts to public high school students (including honors level) for the previous nine years. She had been active in her high school and beyond and had built many different kinds of educational and professional relationships that value advising, mentoring, collaboration, and community building. Among her activities were faculty advisor for a number of student activities, faculty representative on the School Community Based Management Team, and high school coordinator for a university sponsored Teen Reading Program that pairs university students with groups of...
high school students. At the start of the semester, Sarah was a mother of two young children. During the semester, she adopted a third child, a newborn.

Sarah described her teaching philosophy in her final paper (5/11/04). She stated her desire to accommodate and challenge each of her students to use their skills uniquely and successfully. She believes in fostering collaborative thinking not only among students but also between students and herself. Her vision for her students is that they become “contributing, compassionate, and responsible citizens,” and she models this through constructivist teaching and the personal qualities of respect, openness, and vulnerability. She respects the need for students to feel accepted and intellectually safe, and she is herself unafraid to take risks and admit mistakes; “When I work with my students I let them know how I respect and appreciate them as fellow learners and as members of the school community.” Reflection is an important part of improving her teaching. Building community starts with building relationships and classroom communities and then extends outward to the broader society. This is a positive and socially responsible vision of education that starts with one teacher and her classroom.

**Research Experience**

When asked about her previous experiences with action research in the chat for Module 2 (1/28/04), Sarah noted that she had no experience doing research, but she had been part of a professional development program at her high school that encouraged reflective practice: “I think I have been doing this (informally) but I never ‘labelled’ the process before. I can see how I need to refine my generalizing. Our principal has been good at leading us through professional development that relies on inquiry and reflection. He hasn’t pushed the research side.”

**Telementoring Experience**

Sarah began telementoring Corel, a high school senior at Central High School, in September 2003. She and Corel did not know each other and did not meet face-to-face until Sarah attended Corel’s final senior project presentation on May 25, 2004. All of their communication took place via email.

Corel hoped to become a manga/anime artist and a writer. She worked every weekday after school at the local public library and was enrolled in the advanced placement English class in addition to a regular English class that was part of her senior academy’s required program. She had no experience with
mentoring, either as a mentee or a mentor. Like Jessica, Corel was a female member of the high school’s first senior class, and both were members of the same academy. She had been online for seven years and had used the internet, including search engines, and was familiar with chat and email. She had also used online sources for doing research on school projects.

From September 16 to December 28, 2003, Sarah and Corel got acquainted and worked on aspects of Corel’s project. Sarah nurtured the telementoring relationship with empathy, care, curiosity, and openness. The topics they discussed were balanced between those related and unrelated to Corel’s senior project. Corel shared information about the manga publishing business, and Sarah helped her refine the questions she would email to manga publishers in Tokyo and to a local comic artist. Other topics included personal interests, work, family, Shakespeare’s plays, favorite movies, the Hawai‘i International Film Festival, controversial children’s books, Corel’s projects for a graphics class, Sarah’s children, and Corel’s future academic career. Sarah sent Corel 23 email messages, with a total of 4,751 words, an average of 207 words per message. Corel sent Sarah 19 email messages, with a total of 5,507 words, an average of 290 words per message. Sarah’s communication is more fully described in several subsequent sections of this chapter.

**Mentoring Experience**

When asked about her previous experience with mentoring (interview, 8/30/03), Sarah described a number of memorable experiences as both mentor and mentee. As a mentor, she had enjoyed working and sharing with student teachers and new teachers who inspired her to reflect on her own teaching. With her peers, she had participated in collegial coaching and was comfortable being observed, getting feedback, and coaching. She was also advisor for a number of student extracurricular activities, including the literary magazine advisor.

She noted two significant experiences as a mentee. As a student teacher, she was supervised by a supportive, attentive professor. A former principal was also especially remembered. He was sincere, supportive, and interested in his teachers, walking through the halls of the school and noticing praiseworthy activities. He modeled best teaching practices and taught her how to stand back and frame her experiences.

When asked how she expected telementoring to differ from her own experiences of mentoring, she focused on feelings, trust, honesty, and relationship building. She noted that it “takes time to build
relationship and trust” and that this sometimes “comes through conflict.” She wondered whether she would be able to perceive feelings through just words online, without the ability to read body language. She felt that honesty and openness would be important for building trust at the beginning of a relationship, but also wondered how open she could be in her communication without making her telementee uncomfortable. She speculated about the influence of personality and learning style differences, as well as the student’s previous experience with information literacy skills.

**Online Learning Experience**

At the start of the semester, Sarah had limited experience with online learning. She had participated in face-to-face classes supported by the WebCT course software but had never taken a fully online course. While participating in the action research course, she was also enrolled in a face-to-face class that used the same wiki software. It is likely that she had no preconceived notions of how an online course should be conducted or what her role should be as a virtual student.

**Relationship with Instructor**

Sarah was a student in a three-week intensive summer LIS course that the instructor had conducted in 2001 but they had no contact after that until she agreed to be one of the mentors in the high school telementoring project that began in September 2003. During the course, in addition to the online interactions, Sarah and the instructor met face-to-face eight times, five related to course work, once when the instructor attended Sarah’s high school professional development day, at Corel’s final senior project presentation (May 2004), and one interview26 (June 2004). Basically, they met face-to-face approximately once a month from December 2003 to June 2004.

**LEARNING ACTION RESEARCH**

Awareness and reflection, impartiality and insider research, validity, and claims and warrants were the major action research concepts that provided the building blocks for students to conduct their research projects. The topics were presented through module readings and then discussed in chat sessions. Before each session, students posted written responses in the wiki to discussion questions posed by the instructor.

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26 Sarah’s initial interview took place in August 2003, prior to the telementoring project.
and posted their own discussion questions. The following sections are based on Sarah’s answers and reveal her interests, concerns, and confusions, as well as the learning resources she brought to the course.

**Awareness and Reflection**

At the start of the course, Sarah was already experienced at reflection. She noted that she had a “reflective nature” (journal, 2/15/04) and that reflection and inquiry were emphasized in her high school’s professional development program. Of all the course readings, the Mason readings in particular focus on noticing with reflection as a disciplined activity that can be used to support other research methods or, when taken to its most rigorous level, be used as an action research method in its own right. In grappling with the Mason readings, Sarah was challenged to examine her own well-practiced methods of reflection and to clarify, modify, or augment her frames of reference in relation to Mason’s sometimes contrasting ideas. At the end of the course, Sarah revealed that the Mason readings had been among the most difficult for her because they were so “philosophical.” While Mason’s writing style is often circuitous and abstract, Sarah was able to connect his ideas with concrete experiences from her personal and professional life to make the ideas meaningful. Her responses reveal growth over the semester, as well as a concrete, practical approach to the use of reflection.

In her first assignment for Module 1 on “Noticing as Inquiry” (1/21/04), she defines noticing as “being awake/observant, caring, sensitive, able to anticipate possible events/reactions and being prepared for them so that we can respond accordingly/appropriately.” Caring, sensitivity, and anticipation are important aspects of observations. She has a balanced view of the noticing process, recognizing the need to respond both inwardly and to external events: it “seems to be a conscious realization of ‘something’ so that we can react – either to something internally or externally.” Noticing also “requires discipline so that we don't let ourselves get boggled down with what we see/face/must address.” She also notes that we do not notice everything, but rather “what we care about – what we feel comfortable with, what we might have experienced before or be interested in trying” and that this might preclude better, fuller noticing.

Mason provides a new dimension to reflection that challenges Sarah to be more detached. She points out that reflection is more than the “process of stepping back, re-examining a situation, and becoming aware of the incidents so that you can make a decision to react purposefully and effectively, but to Mason,
it is also the ability to describe events rather than justify, explain, assume, theorize or blame.” Watching
without emotional involvement seems to be “key to Mason's perception of effective reflection because then
one's energy can be focused on resolving the matter at hand.” Sarah took up this challenge thoughtfully and
seriously. In a long journal entry at the end of the course (5/4/04), she writes: “Reflection is something that
I do, but I think that forcing myself to reflect without judgment took some effort and it is still tricky. How
does one really separate judgment from the situation – in selecting the action as being worthy of reflection I
am making some judgment.” She also notes that her regular practice of reflecting has become both more
spontaneous and more rigorous:

I also like the idea that noticing values struggle over habit—groping with and searching for changes
in order to improve one's teaching. I can see how the work of the 699 has given me a new way of
thinking and listening and wondering. In the past, I reflected on what worked and what didn't and I
continually searched for ways to improve as a teacher. However, I feel that I am thinking more "in the
moment" now after my experiences with the 699 and that I have rationales behind what I am doing.
(5/4/04)

In her final module assignment, Sarah notes that she has become more discerning about herself and
the data for her research project, through co-reflecting and the exercise of coding:

I like this idea of looking for common threads, structure, patterns in the accounts of noticing. Through
"questioning and challenging" we are able to discern the significant events_REALizations. From the
input of others we are able to identify commonalties/relevancies that resonate with others. Through
the chats, interviews and emails with Joyce, I think I have been able to see some of the "events" more
clearly—in a slightly different perspective. The process of finding the common threads through
coding exercises helped me the most. Until I combed through the emails I sent to Corel, I did not see
our relationship developing—I hardly saw a relationship. Now, when I return to the communication
with attentive eyes and ask, "what is going on here?” I can see so much more intent, connection,
learning, changing. (4/28/04)

**Impartiality and Insider Research**

Dealing with emotions is at the heart of achieving impartiality. At the beginning of the course, Sarah was
aware of this and also intuitively seemed to recognize the importance of social interaction in the process of
achieving impartiality. For Module 2 on "Impartial Observation" (1/28/04), Sarah was asked to record her
thoughts on impartial observation before and after doing the readings. Before reading, she said, "I think this
means to take note of what happens without including perceptions, judgements, or feelings about the event.
Depending on the situation, could it also mean stepping back to let others carry on the conversation –
listening and watching to see where the conversation will go?”
Mason does not exclude emotion from the observation process, because being aware of and reporting on one's emotions is an important part of the noticing process. The distinction he makes is between observing one's emotions as a necessary part of the process and using one's emotions to make judgments about what was observed. After reading, Sarah retains her view of impartiality but has refined it: "I am more clear on what goes into (and what does not) an impartial observation. I was really surprised to see his examples of observations as being so descriptive of what is going on. I expected more of a report. His examples are familiar to me as 'showing not telling' – let your reader visualize what you see, create a picture in your reader's mind."

She feels impartial observations are important because emotions can inhibit us "from actually seeing something else that is going on – seeing what we need to see." Moving from the abstract to the concrete, she makes a connection to an event in her life: "Yesterday my son was cutting out pictures for a collage and I noticed that he also cut his brand new Nemo t-shirt by accident. My emotions got in the way in this instance whereas, an impartial observer would have noted that he did indeed cut out the pictures he had wanted to cut out and he stuck with this task for over 10 minutes." Further, without impartiality, "we might not reflect clearly or process the event adequately."

Though it is not possible to be completely impartial, Sarah feels one can be trained to be as impartial as possible. Again, she relates this to concrete experiences, particularly learning how and why it is important to be detached to be able to help others reflect – an important dimension of co-reflection:

If we have something concrete to look for—count how many times I reprimand, versus praise, this student—I think impartiality is easier. In my collegial coaching training that I have just started we aim to keep our emotional, judgemental responses at bay and instead, lead our partner through a series of clarifying questions or we rephrase what we hear them say so that our partner can learn to self-reflect. In this situation, I'm learning that my goal is to help my partner come to his/her own realizations about whatever 'issue' or goal he/she has established rather than to add my two cents. (1/28/04)

She notes that Mason's methods for achieving impartial observations are a new challenge for her: "After the reading I realized that I need to practice this. I could feel my brain processing this information and I actually thought—wow, this is hard for me. I don't think like this. I need to work on becoming an impartial observer."
As noted earlier, the Mason readings were “too philosophical” for Sarah, who characterized herself as a concrete person. In her final comments at the end of the course (6/17/04), she revealed that in the early modules she felt lost “in a hole” and that the first reading that “really connected” for her was the Ball reading for Module 4 on “Insider Research” (2/9/04). In her response to that reading, with its concrete examples of teacher research, she makes many connections to her teaching experiences. She reiterates that the challenges of being an insider researcher center primarily on the difficulty of remaining impartial while one is researching one’s own practice. She notes a number of advantages of insider research for the teacher herself and for the broader educational community. Teacher researchers can create the context (lessons, strategies, methods) for the research and document their own learning. In contrast to outside researchers, teacher researchers know their students and know how learning might occur – they build lessons on their students’ learning styles, interests, prior experiences, and needs. Teacher researchers also know how to adapt to meet the learning goals and can adapt a lesson mid-stream to accommodate the students. For the broader educational community, the research can illuminate what it is like to face issues in the classroom and the feelings these issues bring about. Action research by insiders can show what might be less visible to an outside researcher who may not be able to detect the subtleties. Most important to Sarah, in this kind of research the theoretical and practical are grounded in what is actually happening in the classroom.

In her writing for Module 12 on “Practitioner Research Concerns” near the end of the semester, Sarah shows a more sophisticated understanding of the nature of action research, making a clear distinction between research and reflective practice:

Are my aims my research? How was my research effective? OR are my aims my telementoring experience? How was my telementoring experience effective? They seem like different questions and yet intertwined. While I'm analyzing my tm experience, I'm wondering if my inexperience as a researcher is closing my mind/eyes to important issues/paths etc. so while my experience with Corel might be “effective” my inexperience as a researcher might make my final paper flawed/incomplete. Interesting how people need to be trained to report on their practice or else it is unreliable. Joyce, this seems to connect to what you were saying last week in the chat – that a reflective practitioner isn't necessarily a good researcher until one is trained in action research. (4/13/04)

**Validity**

Throughout the semester, Sarah regularly questions Mason’s ideas about validity and attempts to find a reasoned balance between the claims of objectivity and subjectivity, through the use of rigorous methods of
observation and analysis combined with acknowledging and engaging with others’ frames of reference. For Module 8 on “Validity Issues” (3/9/04), Sarah responds to the Mason reading on validity by describing how the researcher’s response to the data can be a self-sensitizing mechanism: “He seems to be suggesting that we need to find ways to develop a way of working which may ‘enhance our sensitivity to notice.’ As I form hypotheses, categorize and analyze my data I think I will be working towards enhancing my sensitivity to notice.”

In response to the reading by Merriam (2001: Ch. 10), she is alert to the importance of methodological assumptions and weaknesses as the framework for making meaning and communicating it unambiguously to others:

When Merriam talks about external validity and generalization, she mentions that generalization is only possible in “a small, nonrandom sample if ‘generalization’ is reframed to reflect the assumptions underlying qualitative inquiry.” (210) This means that our methodological assumptions and weaknesses are crucial in order to frame the results? I think I need to know more about this area of the proposal—what are “sample” assumptions and weaknesses? What are ours? (3/9/04)

Merriam’s article also provided her with some of the researcher’s vocabulary she needed for her proposal – triangulation, researcher’s biases, and working hypothesis. Dealing with the “vocabulary” of research, as distinct from the concepts themselves, was an issue for Sarah until the end of the course.

In her writing for Module 12 on “Practitioner Research Concerns” near the end of the semester, Sarah discusses the subtleties of validity in relation to how it is evaluated by others. She is concerned with finding the proper balance among competing viewpoints:

Near the end of the article Mason writes: “Objectivity is after all judged by whether what is observed fits with other people’s experience, and can be observed by them.” This makes me think of the claims and warrant process we went through and how we must be working toward a balance of proving how our situation resonates with others and yet, knowing that what we find significant might not be so to another who reads our writing/research from another perspective. (4/13/04)

In her chat review journal entry, Sarah continues this discussion and voices more questions and concerns about Mason’s view of validity. She also suggests a possible alternative view that can accommodate competing frames of reference:

While validity is essential to the project, and while we outlined specific strategies here to achieve validity, I think our most recent discussions/readings from Mason have clouded the issue for me. Mason suggested that validity lies in the reader’s perceptions of what is being said—how it resonates for that individual. When I consider that, then the previous steps to achieve validity seem fruitless. Also, relying on the validity to be confirmed by individuals who come at the information with such
varying degrees of knowledge and experience seems to create opportunities where those who really
don't know are judging others who do.

I wonder if he really means a different kind of validity—for instance, we have the validity of the
research—the content, the "what happened." That needs to be questioned, read, re-examined by others
(triangulation) but once that information is collated, then does the validity transfer from the document
to the reader—how is this valid for that individual? Even if it isn’t valid for that individual, the
information unto itself could be valid ... I guess there are no contradictions with validity, just
different frames of reference? (5/4/04)

Claims and Warrants

Using the readings (Booth, Colomb, and Williams, 1995: 85-148) and the assignment for Module 9 on
“Claims and Warrants” (3/17/04), Sarah began the process of evidentiary argumentation that she would use
in her final paper. In a substantial writing, she set out a series of preliminary claims and subclaims with
evidence, underlying warrants, and qualifications. In her chat review journal entry at the end of the
semester (5/4/04), Sarah reflects on the difficulty of this module, noting that the research jargon was an
obstacle: “This was one of the hardest sections for me—both in understanding the reading and creating my
own claims and warrants. When I asked Joyce if the claim was just like a thesis sentence, then things
started to click for me—again, I needed the simple vocabulary.” Chart 23 provides excerpts from Sarah’s
online written assignment for Module 9.
Chart 23. Sarah: Excerpts from Claims and Warrants Assignment (Module 9, 3/17/04)

<table>
<thead>
<tr>
<th>Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Claim:</strong> Relationship building is crucial for effective telementoring to happen.</td>
</tr>
<tr>
<td><strong>Subclaim:</strong> students aren't &quot;required&quot; to log online but need a reason to email, chat, post ideas. This will only happen if the learning environment has been established.</td>
</tr>
<tr>
<td><strong>Claim:</strong> One means of building the telementoring relationship is through questioning.</td>
</tr>
<tr>
<td><strong>Subclaim:</strong> posing questions offers an opportunity for the learner to participate &amp; direct the conversation</td>
</tr>
</tbody>
</table>

| Category Contradiction of Claim: While it may be assumed that effective teaching strategies in the traditional classroom session might be carried over to the virtual classroom, this is not entirely true. The nature of the virtual classroom requires the teacher to develop other strategies of reading a student's thoughts, feelings, learning, and comfort zone. Through purposeful questions, the telementor may carefully build the relationship between mentor and mentee so that the virtual classroom provides a safe learning environment for the student. |

<table>
<thead>
<tr>
<th>Evidence: Emails with Corel</th>
</tr>
</thead>
<tbody>
<tr>
<td>* I will categorize the questions according to questions that I wrote to make her feel &quot;safe,&quot; &quot;validated,&quot; and &quot;acknowledged.&quot;</td>
</tr>
<tr>
<td>* I will also analyze the types of questions I posed and my rationale for posing these questions.</td>
</tr>
<tr>
<td>* Finally, I will analyze her response to the questions to see if my questions led to the desired response.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Types of questions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* In order for learning to occur, a student needs to feel safe, validated, and &quot;listened to&quot;/ acknowledged.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Warrant</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Concede objections that you cannot rebut:</td>
</tr>
<tr>
<td>* Granted, the student was encouraged by the librarian she was working with to email me, so our correspondence is not entirely based upon the student's motivation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Stipulate the degree of certainty of your evidence, warrant or claim.</td>
</tr>
<tr>
<td>* The data I am using as evidence comes from email correspondence with Corel and from my journals in which I reflect on our correspondence and the telementoring process.</td>
</tr>
</tbody>
</table>

PLANNING AND CONDUCTING RESEARCH

By doing research projects, the students demonstrated their understanding of action research concepts. In contrast to Ruth who had no experience with telementoring, Sarah had telementored Corel for four months before the start of the course. She identified her research topic – building a virtual relationship – early in the semester. Like Ruth, however, she had difficulty focusing her research questions and concluded after writing her final paper that they were still too broad. In our exchanges as student and instructor throughout the semester, the issue of focusing the research questions arose frequently. Sarah’s expansive curiosity led her to question and consider many aspects of both her topic and the means to apply action research.
concepts. Analyzing her data led to the complicating action in Sarah’s learning narrative. The original focus of her research project was how she used online communication as a librarian and teacher to build a virtual relationship with her telementee, Corel. Instead, the data led to her discovery of a different role for herself in the relationship.

**Telementoring a High School Senior**

As noted at the beginning of this chapter, the high school telementoring project began in September 2003 and Sarah’s work with Corel during the action research course was a continuation of this activity. During spring 2004, the email exchanges were fewer in number and volume than during fall 2003. The total number of email messages sent by Corel to Sarah from January 12 to May 20, 2004 was 14, with a total of 2,707 words, an average of 193 words per message. This was approximately half the number of words of the messages Corel sent Sarah in fall 2003. During the same period, Sarah sent Corel 24 email messages with a total of 3,919 words, an average of 163 words per message. This was about 80% of the number of words of the messages Sarah sent to Corel in fall 2003. Topics included amusing family stories, Corel’s schoolwork, advice on revising the senior project proposal, movies, English literature, books for Corel’s AP English class, Corel’s design of her own prom dress, and the plot of Corel’s manga story on the crystal methamphetamine (ICE) problem in Hawai‘i.

Sarah’s description of the relationship is discussed more fully in the section of this chapter that discusses her final paper. Here, two email exchanges – one at the beginning of the relationship in September 2003 and one at the end in May 2004 – are presented to provide a more holistic view of how the two individuals presented themselves and interacted online. On September 16, 2004, Corel sent Sarah her first email message, introducing herself and giving an indication of her interests, thinking processes, and writing style:

> Hi,

I work at Dalton Public Library every weekday after school (unless there's holidays or I have to work on a project). I only make $5.75 as a student helper and my mom says the only thing I get as one is sick leave (my mom works in the library system as a library tech.). I like to read and draw anime/manga. I listen to alternative music and J(apanese)-pop.

I'm taking AP English and have to write an essay on the Al Pacino documentary on "Richard III", "Looking for Richard". We have to discuss the success of Pacino's argument for "everybody's Shakespeare" (that Shakespeare's plays can be enjoyed by everyone, but people are intimidated by his
plays, etc.) and what in particular supports or refutes his intention. It's mostly going to be an opinionated essay, therefore, could I possibly have your own opinion on Shakespeare's plays, "Richard III" in particular (if you've ever read it or seen it? I think the great thing about Shakespeare's plays is that you never really know what's going on in his characters' heads, you never really KNOW them. There are also several reasons I could see why people would be intimidated by Shakespeare (even though he is dead) maybe because his stories are still going strong in our culture, even more so, for over 300 years. Many people see Shakespeare as a literary genius, which is I guess, in itself a turnoff. Most people probably think, "Well, if he's a genius, then how could I even understand him?". There are bits and pieces that are related to the lives of present-day Americans, many of his quotes have become cliches. Many teenagers secretly have boyfriends/girlfriends, unknown to their parents (somewhat like in "Romeo and Juliet", people who like each other often fight/tease one another (like in "Much Ado About Nothing"). People often see Shakespeare's stories in many other stories and movies, without even realizing it. (9/16/03)

Sarah responded the next day (9/17/04), following up with comments and questions about the information Corel had given and directing her final questions to Corel's senior project. Her relationship building strategies are evident. She shows an interest in Corel, validates her opinion about the intimidating effect of Shakespeare on many, encourages her about an essay she is writing, attempts to show understanding and create solidarity by sharing anecdotes about other students Corel's age, and encourages her to share more information about her upcoming internship:

Hi Corel,

Yes, I know exactly what you mean about people being intimidated by Shakespeare and yet we live his dramas in our lives. Ray Bradbury says in Fahrenheit 451 that good authors touch life often and it seems that Shakespeare knew humanity—its loves and weaknesses. Funny isn't it how time can pass, technology can advance, and yet we are still grappling with some of the same issues in our lives that Shakespeare wrote about. I haven't seen Richard III but it sounds like you have a grasp of what to write about. Good luck with your essay.

Do you like working in the library? Wow, you work so much—every day. You must like it then. $5.75 isn't too bad—at least you don't have to flip greasy burgers and deal with rude customers at the drive-up windows. Some of my former students work at McDonalds and they are treated so horribly by customers. What are your responsibilities at the library?

When I had my first job in high school I made only $3.50—still, I was so excited to have a job and to be making money. You know, it's odd because I'm sure I earned more babysitting for people.

What alternative music do you listen to? Have you ever heard of Sleater-Kinney? One of my former students really liked them but none of my other students had ever heard of them. That was a few years ago now—I don't even know if the band is still together.

Your internship is coming up. It sounds like a neat opportunity. Do you have some expectations/hopes/worries about it? What will you be expected to do for the internship or after it? I mean—has anyone worked with you to create a set of goals that you intend to achieve as a result of the internship? Questions to answer?

I'm glad to hear from you and feel free to send any questions my way. I look forward to working with you and learning more about manga, your favorite authors, working at the library, life at Central and of course, your big research project.

=) Sarah (9/17/03)

A second exchange presented below occurred on May 17-18, 2004 at the end of the telementoring relationship, just before Sarah and Corel met for the first time at Corel's final presentation on May 25.
2004. Since the beginning of March, the two had been discussing the senior prom and Corel's design of her own prom dress. Before this message, Corel had sent Sarah a draft of the plot of her manga story on the dangers of "ice" and discussed the college entrance requirements for the University of Hawai'i. Here, as she had done throughout the relationship, Sarah combines commentary, encouragement, praise, her high school teacher's understanding of Corel's situation, and amusing stories from her own life.

Hi Corel,

Exciting your dress turned out how you wanted it to. Lucky too that it fits in with your projects. I never wore any of my prom dresses again. At the time, I thought they were pretty, but now I look at them and think, "ugh."

Your story is really good. Did you do a lot of creative writing for your English classes? At the end of my senior year, I had a horrible time concentrating—I think your teachers know this. I always tried to make things easier for seniors at this time of year.

I didn't realize that UH required a 5 for the AP test—wow, pretty strenuous. My impression was that a lot of schools accepted 4s or 5s. Do you remember the essay question you wrote on? What book did you write on?

Did I tell you that my son's new thing is to watch Kikaida DVDs? His favorite Dark Destructoid is Orange Ant. Yesterday, he took Amy's little plastic grocery cart and stuck it on top of the vacuum cleaner handle to create his own Dark Destructoid. He pretended to catapult missiles from the vacuum cleaner by using the toy cupcakes and hamburgers from their plastic food collection. It was pretty hilarious. Did you ever watch the Kikaida reruns when you were growing up?

When is your presentation date? Let me know if you have anything specific you wanted to work on with your story. =) (5/17/04)

Corel replies the next day and continues the conversation about prom dresses, thanks Sarah for the compliment on the plot for her senior project manga story, continues a discussion of university entrance requirements, and gives more news about her schoolwork and senior project presentation:

Maybe your prom dress will come back into style sometime (my mom says that they always renew fashion styles, and I guess she's right). It's not something like the one from "Never Been Kissed", is it? (her flashback of prom night).

Thanks. I took a creative writing class last year, but we didn't really do anything (I don't think I really learned anything in that class ...). I used to write anime fanfics though, and some other fictional stories.

I should take your class.

Maybe UH does accept 4's and 5's ... We had to do one essay on two poems and write about their meanings and similarities, etc. Another was on a passage from a book (something about a tutor, a rich, fat woman, and her ill little son). The last was to choose a story of your choice, and I chose "Gulliver's Travel".

lol, You should've taped it. I used to do stuff like that when I was little. My dad used to love "Kikaida". He even made a Kikaida painting for my cousin when he was younger. They have Kikaida anime too (you can watch it on Cartoon Network). I never watched Kikaida when I was little though.

The presentation date will be on Tuesday, the 25th of this month. (I have to work quickly ...)

Right now, for AP English, we have to finish reading this book, "the Stranger" by Albert Camus. It's ok. It's an existentialism book (I really had to work at pronouncing "existentialism", lol). I don't think our AP English teacher will make us do anymore essays (I hope). (5/18/04)
Sarah replies on the same day, no doubt conscious of Corel's impending deadline to complete her manga and prepare her presentation within the next week. In a chatty and encouraging manner, embedded within a description of her recent struggles to complete her final paper for the action research course, Sarah subtly suggests how Corel can organize her final presentation.

Wow—I can't believe you folks are reading another book—after the AP exam? I know the AP teacher at our school feels the students really need a break so she has them help her plan/organize the giant end of the year yearbook party where kids get their yearbooks and DJs come etc. She argues that the AP kids work so hard all year that they are near emotional/intellectual breakdowns after the AP test. Still, The Stranger is a curious book. I read it in French originally and then in English and I remember being struck by the apathy of the first line—"Mother died today, or maybe yesterday..." something like that. I was shocked that someone wouldn't feel more "something" at the death of his mother. Obviously, I was a naive little girl. Do you know the band The Cure? They wrote a song about The Stranger. Actually, existentialism is something that I read a lot of in high school—you might try Sartre's No Exit. It is a play about his idea of what hell is. I also liked Camus' The Plague. Anyway—sorry you have to read another book at the end of the year! Get the answers at PinkMonkey.com (Shhhhh—don't tell).

I hear you about your creative writing class—isn't it frustrating when we feel a class is a waste of time? You must have been one of the students who came with a talent and interest in creative writing and maybe the teacher tailored the class to the students who didn't have these interests/talents? One of my biggest fears as a teacher was that students would say "I learned nothing in your class." I always tried to ask the students what they wanted to work on or learn or improve and then I tried to bring those things into the class. Still, that is a lame teacher question isn't it? I remember in one of my graduate classes the professor asked us this and I had no idea what the class was about or what any of it meant and I couldn't make a list of what I wanted to learn because I felt I knew nothing and "duh" wanted to learn it there.

May 25? Plenty of time! I think that you and I are procrastinators—I just finished a giant paper for Mrs. Yukawa and I think she thought I would never get it done. At the last minute I did my research, analyzed my information, synthesized my ideas and started writing—one semester in one week. Anyway—your story is solid and will hook your listeners. I can hear evidence of your knowledge of ice and its effects on the community. Your proposal outlines how you went about this process. Do you still have things you feel you need to work on?

I will look at the rubrics that Mrs. Suzuki gave us in the handbook and then I'll email you again.

Who do you present to on the 25th?

Let me know if you want me to proofread the proposal or the story for anything in particular.

Good luck! (5/18/04)

By the end of the academic year, the relationship seems to have been solidly built through no other medium of communication besides email. Both Sarah and Corel seem comfortable sharing thoughts, feelings, interests, plans, experiences, anecdotes, and laughter. It appears that Sarah has been successful in implementing important aspects of her teaching philosophy in the virtual environment. She has provided an environment that fosters and promotes collaborative thinking. She has encouraged Corel to feel respected, accepted, and intellectually safe by modeling respect, acceptance, and the willingness to take intellectual risks. She has shared stories, laughter, and frustrations in the effort to find the universality of their
experiences. She has been open and vulnerable, admitting mistakes and uncertainties. She has demonstrated her respect and appreciation for Corel as a fellow learner. In her final paper, Sarah discusses the time, effort, and strategies she used in order to create an online environment that would foster such open communication.

**Focusing the Research Question**

Relationship building was important for Sarah not only as a telementor to Corel. As a telementee in the action research course, she demonstrated the same skills in building a trusting relationship that fostered open communication, taking intellectual risks, and creating new knowledge collaboratively. She also showed herself to be an active learner who took the initiative to present her ideas, ask questions, and solicit feedback. Our early email exchanges on focusing the research question set the tone and rhythm for our communication throughout the semester. I will quote extensively from a series of emails related to focusing her research question, exchanged from January 26 to February 16, to illustrate the characteristics that helped us develop a strong online relationship to support the co-reflection that furthered our co-learning about action research. The icons represent a speaker or a change in speaker.27

At the start of the semester, Sarah had no research experience but was able to relate her previous professional development experiences to her learning about action research. Also important was the fact that she had already completed four months of telementoring Corel, giving her a context and concrete experiences to work with. In the first independent wiki page she created on January 26, Sarah brainstormed some questions as she began to consider her research topic:

- How does one build a “virtual relationship”? Does it take longer?
- Does the telementor’s self-efficacy affect the relationship building – would I have been more willing to take chances in the wiki site, create pages, and perhaps motivate the student to do so as well had I been more comfortable and daring with the technology? (I’m referring to the Five States of Mind I just learned about in a Cognitive Coaching Class: Efficacy, Flexibility, Craftsmanship, Consciousness, and Interdependence. I can see how my hesitancy led me to be inflexible – to want to know “concretes” and bogged down by my own “mental blocks.”)
- How is noticing different via telementoring?
- How does the role of the telementor play change at different stages of the process?

27 Sarah’s icon is ⬤, and the instructor’s icon is ⬤. 
(This is tied to relationship building) What motivates the student to log onto the wiki email and put a query out there for the telementor?" (1/26/04)

The first question she posed remained her strongest interest and was the focus of her research project and final paper. Her second question drew from her experience with peer coaching, helping her ground her thinking in actual experience. The wiki page initiated a series of emails between us in which we brainstormed ideas as she refined her focus. I first asked her to consider some generic questions that help to frame the entire research process from beginning to end:

- What knowledge and past experiences propel you to ask the question?
- How will you answer the question? What kind of evidence will help you answer the question?
- How will you gather that evidence? E.g., your question about what motivates a student to log on ... how could you answer that one?
- What do you imagine your report of findings might look like? (1/26/04)

Her email response on January 27 gave me a clearer picture of how she understood action research by connecting it to her experiences as a reflective practitioner. She admitted that the idea of measurement was one she was not ready to tackle without further examples of teacher research and a better “feel for the type of inquiry” she might like to do. The tone of her writing is chatty and expressive, more like a face-to-face conversation. By writing in this manner, she made herself visible to me both cognitively and affectively. She began and ended her email by thanking me for my questions, which I felt was a sign of respect as well as gratitude.

Sarah: Thank you for these questions. You are sharp, too. I don’t have answers that pop into my brain immediately—I need to process my answers a little first. I really have no idea how I would measure some of my questions — this is a hard question for me. I was just letting myself wonder things and hoping that my brainstorming (which is still in progress) would yield some possibilities. I think this must connect to the Mitchell article ["Why Do Teacher Research?"] in some ways because I feel that I have done a lot of informal gathering of information throughout my years as a classroom teacher, but that I haven’t always been recording or processing the observations in a meaningful way. I notice, make changes in my behavior or methods and observe again. Like he mentioned, time is a factor for me. There is so much to consider. I think I need to read more teacher research and see what others did and how they went about it so I can get a feel for the type of inquiry I might like to do and the ways of going about it. Thank you for your questions. (1/27/04)

Sarah was aware of her need for concrete examples of action research in order to delve more deeply into it. She was not satisfied with only reading generally about the process of doing it. In the wiki, I had posted web links to sites with such examples and anticipated that she would explore them, which she did.

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My email message of January 28 was the longest I had sent to Sarah to date (671 words). Though for some students such wordiness would have been inappropriate, I was encouraged to be open, lengthy, and detailed with Sarah for several reasons: (1) she appeared enthusiastic about her research and avidly seeking information and feedback; (2) her openness in expressing thoughts and feelings in her previous communication with Corel and myself encouraged me to respond in kind; and (3) I was genuinely interested in the aspects of telementoring she wanted to explore, which were closely related to early research questions I had posed about telementoring. In the message, I shared my experiences with focusing a research question, discussed the difficulties of seeking measurable results in qualitative research, praised her effective noticing and reflection skills, and shared some of my own noticing practices.

Sarah replied to me on January 28, showing her understanding and appreciation of the time and thought that had gone into my response: “Thank you so much for writing such a thoughtful, reflective, personal response to me. You spent a lot of time thinking and writing and you gave me so much more to consider. I appreciate your honesty and your insights!” Sarah’s wiki page and the two follow-up emails just described are an early example of the process of co-reflection at work: a sharing of reflections that leads to new and deeper understandings and deeper affective connections – two important building blocks for relationships.

On February 14, Sarah emailed me with a more focused research question: “How has my method of communication, my means of noticing/observation, and my definition of what it means to be an effective teacher changed due to the virtual format?” This remained unchanged as her primary research question, although she later posed more specific research questions related to the questioning strategies she used with her high school mentee. She was aware of the breadth of the topic, saying it was “too wordy and probably too broad.” She was already beginning to frame the background and limitations of her study: “I’m not the person in charge in this project as I am in my classroom. I’m not setting the time line, the project, the assessment etc. Can I state that someplace in my proposal – to help me limit what I will examine?” She also mentioned an important point that would remain an issue for her throughout the course – that the language of research was alien to her.
In a long journal entry submitted on February 15, Sarah continued her process of thinking out loud as she considered her research project in response to assigned readings that included an article on insider research by Deborah Ball (2002). She appropriately identified factors that should be included in a description of herself as the researcher: “[M]y ten years as a classroom teacher, my exposure (although limited) to WebCT and email etc., and my reflective nature must figure in.” She initiated a dialogue with me using her reflections about the readings, asking specific questions but also wondering aloud in a way that respectfully invited but did not demand comment or further action from me:

Sarah: I really liked the questions sample 2 posed. If I borrowed those ideas of “beliefs and assumptions” and “skills and practices” would I need to quote this study? I was interested in sample 2 quoting Janesick (1994) “look at the meaning and perspectives of the participants in the study” for a couple of reasons. I wondered if seeing Janesick’s complete publication or the chapter this reference came from might be helpful. I wondered if Joyce has read it. Then I wondered if I would need to read about, research “how teens communicate” or what their needs are. For instance, kids in the early pre-K and K years need the opportunity to explore - learn through play - and a feeling of safety in order to take chances … In a sense, teens need that feeling of safety, but this is just my own belief, I wondered if in order to examine my communication with Corel, if I needed to examine what research says about the way teens learn.

To get back to the question - I was wondering if going back through the emails could be one method of my attempt to name and analyze the experience – to pull out what I was doing at the time. Maybe I will begin to see patterns I didn’t see when I was “in” the conversation. (2/15/04)

As a librarian, educator, and researcher involved with the high school telementoring project, I had considered many of the questions Sarah did in her early brainstorming. However, “how teens communicate” was an aspect I had not considered. This comment of Sarah’s pointed out the critical importance of doing research on a topic rooted in one’s own experiences.

The following paragraph from her February 15 journal entry was remarkable to me for her frank admission of self-doubt, her open concern about what her instructors thought of her work, and for her ability to self-regulate her anxieties so that they did not interfere with her learning. I felt that she was being honest and sincere, and I was glad that she trusted me enough to reveal these misgivings.

Sarah: When I read the three points necessary for credible, qualitative study in the Janesick article, page 108, I began to panic a little – how will I show validity, triangulation etc. Self-talk shushed this immediate doubt so I could go on to think about my essential/driving questions. Still, whisperings of anxiety linger – will my question/research/thoughts “measure up” and then I wondered, to or for whom? Ultimately, am I taking the 699 for myself – for the experience and practice of studying my experiences? If that is the answer, then I feel okay, I’m a little nervous to share with Joyce just because I don’t want her to feel let down by my inability to process everything she has shared and guided me through. I think that students who “don’t get it” sometimes take more
time to process the material and that a student's achievements cannot always be attributed to the teacher's efforts. (2/15/04)

In the final section of her journal entry, she probed several critical issues from a course reading on insider research – how to bring forth deep insights while remaining objective – in a concrete and personal way. In all her communication and work, including her final paper, this characterized Sarah’s writing and made her insights highly accessible. This was very valuable in helping me understand Sarah’s learning process in the absence of the nonverbal cues available in face-to-face interactions. In these paragraphs, she is also mentally agile, considering alternative views from a desire to further examine first and second thoughts.

Sarah: To return to my intentions of addressing some of Ball’s questions: From the section entitled “Scholarly Stance: Composing Distance and Insight,” pg. 392: “How does the first-person researcher create the conversation with herself that makes it possible to excavate, name, and analyze aspects of experience unseen to the outsider?” I will grapple with this throughout the research. Further down the page, Ball points out that we must see the research “apart from, their efforts and desires” and that we must not defend if questions arise. This reminds me of Mason—don’t justify, explain, rationalize. I do these things all the time! I think it will be hard for me to shush explanations because I have made them such a part of my communication in every day life—it’s almost as if I feel people won’t want to listen to what I have to say unless I can provide the relevance or justification. Maybe I can blame my mom and sister who incessantly asked me, “Well, didn’t you consider this?” as if I had overlooked some really obvious point. Now, regardless of the situation, I spend my time trying to anticipate what my audience is thinking and trying to address all possible questions/criticisms. No wonder I’m so long-winded. This could be a study unto itself—why do I feel the need to justify my ideas?

In other sense, I think the outsider who reads my writing will know already how technology can be a barrier in some situations—I think many teachers would concede that they rely heavily on face to face communication to read their students and check for understanding. Hey, this just made me realize that I should start to list some specific ways that noticing is different via telementoring, which is what Dr. Inoue, asked me in that first chat. On the other hand, to an outsider, my question might be a “no brainer” – of course you had to change your teaching, why is “this” an issue?

Things are beginning to become a little less murky—just a little. But, I am excited about all of this. (2/15/04)

In my long email response (664 words) to her on February 16, I tried to answer her questions, reassure her, affirm her good insights, provide new things to think about, admit my own inadequacies as an action researcher, express my gratitude to her for helping me learn, and encourage her to continue the conversation. The content of this message addresses or implies two core action research issues brought to mind by Sarah’s thoughts: that the researcher is the primary instrument in action research and qualitative
research, and that validity is a difficult issue that each qualitative researcher defines contextually. I ended with the recognition that Sarah and I were co-learners:

- Meanwhile, anytime you have a thought or comment – it doesn’t have to be in a weekly journal entry – do feel free to keep the conversation going. What you’re saying is most definitely helpful to me as I go through my own inquiry process ... stimulates me with new ideas, resonates with some things I’m thinking about, sparks thoughts about possible new directions to take in the 699 ... so I’d really appreciate hearing from you anytime. On the other hand, I don’t want you to feel pressured in your otherwise busy life to keep having to write to me! ;) (2/16/04)

In the final email of this episode, sent on February 16, Sarah let me know how my answers had affected her. This feedback was important to me as an instructor, as it helped me to better understand her thinking and provided me with more information to use in responding appropriately to her as a learner:

- Sarah: Thank you for your comments. Your answers helped me to see where I’m on track and what my next steps might be. I especially liked your suggestion that as I sift through and categorize, rethink, look for themes with my emails to Corel that I also consider them in connection with similar F2F situations. This would be really good for me to do. You know, I think I am doing that in my head – but look at how I didn’t even notice it enough to “name it.” It was interesting for me to see what you commented on in the journal – with a few items, I almost didn’t include them because I felt I was getting off topic, but your comments showed me that it was okay for me to state my thoughts/wonderings because from your perspective, you saw the relevance. I truly appreciate your comments and I look forward to continuing the conversation. (2/16/04)

Summary Discussion

In this episode on focusing her research question, Sarah demonstrates her skills at reflection. She is aware of her experiences as a reflective practitioner and notes how new information about action research impacts her thinking about prior experiences, knowledge, and understanding. She also notes what she thinks will be difficult for her to do. She regularly returns to her experiences, making connections between particular memories of events and abstract ideas encountered in the course readings. She states several times her need to relate ideas to concrete experiences. She probes the nature of difficult ideas, such as how to make an impartial observation. Questioning appears to be a regular part of her thinking process, leading her to continually reexamine her assumptions and conclusions and to seek alternative meanings. She attends to her feelings, not by ignoring or avoiding them, but by admitting them and grappling with them. These early exchanges show Sarah sharing her ideas and beginning to shape her research proposal and parts of her final report. She was learning a new language – the language of action research – through reading, questioning, and clarifying concepts with the instructor.
Sarah also demonstrates her skills in interpersonal communication, applied in the online environment. These early email exchanges indicate the qualities that characterized Sarah’s communication throughout the course: openness, honesty, visibility, empathy, humility, gratitude, and the inseparability of the cognitive and affective dimensions of learning. Sarah asked questions and gave context when she was confused or needed help. She gave me immediate positive feedback when I did something that was helpful for her learning and expressed gratitude for help she received. She “thought out loud” when she wrote her emails or journals, helping me see more fully and clearly her thinking processes and emotional reactions. She did not hesitate to examine herself and admit fears and weaknesses when she found them. By being expressive and detailed, she made herself visible to me both cognitively and affectively and helped our relationship overcome the barriers of the electronic medium.

In this episode, I felt my role to be primarily instructor or learning facilitator who: (1) asked some standard questions to help her visualize her data and the form of final report; (2) clarified terms used in describing the research process and writing the final report; (3) suggested additional data collection methods; (4) supported her brainstorming and exploration of questions, values, and assumptions; (5) shared personal methods used to work toward impartiality; and (6) suggested future steps in the research process to help her anticipate next steps.

This exchange shows the seeds of online co-reflection that would develop in more depth during the semester. The nature of co-reflection is that participants in the discourse build knowledge together, bringing in their experiences and the use of relevant information, in order to achieve understanding of a topic, issue, or problem of interest. Individuals are engaged in collaborative learning – meaning-making with others – in order to extend and transform their understanding through a jointly undertaken activity. Co-reflection involves the key aspects of reflection and is fostered in relationships based on respect, trust, concern, and sincerity.

Several important themes and issues emerge in this episode: Sarah’s need to understand the vocabulary and context of action research through parallels in concrete experiences, the importance of relationship building as a research focus, the characteristics of Sarah’s communication that make her cognitively and affectively “visible” online, and the beginnings of the process of co-reflection.

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Emotional Challenges and Learning Support

The course was emotionally as well as intellectually challenging for Sarah, who was new to research. In general, emotions are important to Sarah, as can be see in the statement of her teaching philosophy, her concerns about building a relationship with Corel and providing her with a safe and nurturing intellectual environment, and the uncertainties she expressed related to her understanding of the key concepts of action research. As previous discussions in this chapter demonstrate, Sarah frequently included comments about her feelings in her course assignments, email messages, and chats. Because of this, I was aware of the affective dimension in my efforts to provide her with learning support.

Dialogue on Online Questioning Strategies

In addition to the exchanges already discussed, the following email exchange is another example of the kind of learning support the instructor gave Sarah, as well as the co-learning and co-reflection that occurred throughout the course. In this exchange consisting of two emails sent on March 7-8, Sarah and I discussed online questioning strategies as a possible research focus and the implications for her data collection and analysis. She initiated with a journal entry on March 7 in which she reacted to a reading I had provided by David Wood, “Teaching Talk” from Thinking Voices: The Work of the National Oracy Project (Norman, 1992). This is an example of how Sarah used all the resources available to her for reflection – past experience, information from a reading, and the knowledge of her instructor – to help her better understand her research topic. It is also an example of an engaged, active mind at work, noting idea after idea and question after question in rapid succession. Sarah commented on this in her final interview on June 17: “[A]t one point you told me that I kind of turned the emails into journals; I think that as I was typing there I was thinking and things were happening.”

This is also an example of multi-layered co-construction of knowledge. The Wood article was one of seven articles I had given to Sarah that I felt might be useful to her, based on our previous discussions. Of the seven, the Wood article became seminal in the development of her ideas for her research project and final paper. Her email message focused my thoughts on questioning strategies in the classroom vs. the online environment. In rereading the article before responding to her, I saw his ideas in a new way through attempting to “read with her eyes.”
Excerpts from the two emails are presented in Chart 24, integrated into a format resembling a conversation. This is followed by discussion. The icons represent a change in speaker. 28

Chart 24. Sarah-Instructor Dialogue on Online Questioning Strategies (3/7-3/8; excerpts)

<table>
<thead>
<tr>
<th>IDJ</th>
<th>Hi Joyce,</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>... I'm not sure if I mentioned it before, but David Wood's article is giving me a lot of food for thought — validation for what I have done with Corel and what I did in the classroom, but also insights into how the issues surrounding questions in the classroom are truly changed by the telementoring format:</td>
</tr>
<tr>
<td>IH</td>
<td>Hi, Sarah, If this is happening, it seems a good sign that there's relevance for your project.</td>
</tr>
<tr>
<td>IDJ</td>
<td>1. He suggests that the majority of teachers ask two-choice type questions and exert control over where the discourse goes. This means that students answer and then lapse into silence.</td>
</tr>
<tr>
<td></td>
<td>* I was wondering if I asked Corel mostly these questions—factual, yes-no, or two-choice.</td>
</tr>
<tr>
<td></td>
<td>* I think that I did try to &quot;control&quot; the discourse because I was trying to understand where we were going. (Do you think this would be a part of my study of my questions in data collection—the type of question I posed and the rationale for posing it? Would I also analyze her response or lack of response?)</td>
</tr>
<tr>
<td>IH</td>
<td>Yes to both questions. Categorizing your questions, with your rationale for posing them, is the first step of your data analysis. This is &quot;coding.&quot; The natural next step is to analyze her response to see if your questions were having their intended effect. I think you can only describe her response or lack of, as you see it in the email data. If you want to go farther than that, you'd have to interview Corel and perhaps others helping her with her project. My intuition tells me you'll have enough data for a good project this semester without doing interviews. I also think with the time demands on you already, this isn't practical. But if you were to do another study like this, it would be something to consider. This is something you should put in the &quot;methodological assumptions and weaknesses&quot; part of your proposal.</td>
</tr>
<tr>
<td>IDJ</td>
<td>2. If a teacher shares a &quot;personal contribution&quot; students are more likely to engage in a discussion.</td>
</tr>
<tr>
<td></td>
<td>* I might look at how I introduced my personal contributions or if I ever framed them with questions I posed to her. I'm thinking that my desire to build a relationship with her and to create an atmosphere of trust for her in TM led me to explain my questions—to share a personal anecdote that might let her know where I am coming from. I think I did this at least—I need to check. (This makes me wonder why I'm not researching how a telementor builds a relationship with his/her mentee so open communication etc. can happen. Couldn't examining my questions be a part of relationship building? Would it be a way to focus my question topic even more?)</td>
</tr>
<tr>
<td>IH</td>
<td>Yes, the relationship-building would be an important aspect because this is teleMENTORING. Again, as I noted above, you can only interpret the data you see in the emails, so you can fill in your side of what's between the lines, but not hers. Another thing to put into &quot;methodological assumptions and weaknesses.&quot;</td>
</tr>
</tbody>
</table>

28 Sarah's icon is 📝, and the instructor's icon is 🔄.
3. Wood argues that asking questions doesn’t always encourage thinking and he gives a list of modes of teacher talk that create a classroom environment that encourages students to mirror the style of the teacher—if the teacher speculates, the students do: speculate, suggest, surmise, inform, interpret, illustrate, and listen/acknowledge.

* This kind of took the wind out of my sail because it seemed to be leading me away from examining my questions, but then I was thinking that maybe this in itself might be something I examine—did I engage in “mirroring”? I was wondering if I might comb through my emails to her and see if I can recognize any of these or if I embedded questions within these types of comments.

** Good idea. Your analysis may get more complex as you look more deeply into the purposes of the communication. You might come up with a different concept of what a question is. Sometimes things that are asked in the form of a question (with a question mark at the end) serve different purposes—probing, invitation, polite way of stating agreement or disagreement, etc. You might also find that some things you stated without a question mark at the end were actually a kind of question, I don’t know.

*(From my experiences, I know what he says to be true, yet I wouldn’t have necessarily have thought of it on my own. When I just typed the list speculate etc., I was thinking this is the type of discussion I did on a daily basis with my students or encouraged them to engage in. Does this mean that if I create a chart or matrix to collect the data using these terms, would I cite his article alongside the chart?)

** Yes, you would cite his article as a footnote to your chart.

4. Reading his article and considering all the control teachers try to exert in their questioning techniques, I wondered if telementoring creates a more level playing field. Wood suggests that like judges and police officers, teachers expect answers. However, in the TM format, I noticed that Corel frequently let some of my questions go unanswered. I thought this might be interesting to look at too—which went unanswered and why? (Maybe my long-winded, chatty emails confused her.)

** Good insight about how online communication creates a more level playing field. Others have had this same insight, so there are things in the literature you can connect to. You might add this area to the lit review section in your proposal: differences in face-to-face and online communication in educational settings. There is literature on this, and you could only skim the surface this semester, but then do more investigation later.

5. He talks about wait time—I remember this being hard as a new teacher but now I’m comfortable with the silence of wait time.

* This made me realize that I am equating my emails with Corel as a type of slow motion discussion—time slowed down. I wondered if emails are really letters and not discussions at all, or if I could equate an email conversation as a discussion. Would this go into my assumptions as a researcher? Ultimately, I don’t think questions in TM have the problem with wait time—maybe a chat would.
Another good insight to include in your data, although I wouldn’t include this in the proposal. Which of your research questions would this data apply to? It doesn’t necessarily have to apply to any at this point, but it’s good to keep your questions in mind so your explorations are as on focus as possible. This is the tricky part of doing exploratory research ... you have to try not to get too far off track from your research focus, and yet something important that may seem to be off track on the face of it may actually be very pertinent to refining your focus. This is always your call as the researcher and part of the art of research.

As I read through the article, I also realized (I didn’t go back to verify yet) that Corel never asked me questions about my personal life until I first shared something with her. I need to look at how she first introduced needing “help” or if the help she asked for came as a direct result of a question I posed.

Yes, good to look at this. Again, this would be data in answer to one of your research questions. Which question would that be?

Wood also suggests the purpose for questions (page 205): to motivate, sustain, direct the thought processes, promote reflection, analysis, self-examination, enquiry.

You could do something like “speculate [... etc.] are commonly recognized question goals for teachers (e.g., Wood, 1992; X, 1998; Y, 2000)” blah, blah. Then you could find a few more prominent examples to link to in the literature.

Are the questions I’m asking you here some initial hypotheses for my data collection? Could they be questions that I pose to you and Ruth for validation—in the sense, yes you might be onto something here so pursue this.

I think this is a good way to think of them. “Working hypotheses” that you’ll refine as you go along. Posing them for Ruth and me would be good — a way for you to clarify and synthesize your thoughts and get feedback.

Are the “realizations” I had while reading Wood relevant to my research and if so, where would I put them in my proposal?

Have your realizations from reading Wood clarified your study purpose and exploratory questions in any way? As for the Wood reading itself, you could summarize the points you’ve found significant (the things you’re responding to here) and put this into the review of the literature.

I guess my last question—does this count as a journal? =)

Yes, indeed. :) You’re making me rethink “journal” as being a much more interactive thing, which I think is better.
Discussion

By March 7, when this episode began, we had discussed noticing, impartiality, research methods, insider research, research proposals, data collection, and data analysis in general terms (Modules 1 – 7).

In this journal entry, we see Sarah in the process of reflection. She probes her correspondence with Corel and evaluates her classroom experiences through a new lens suggested by Wood. She reads, thinks aloud, and shares her awareness of her thinking processes. She makes a leap of thinking and wonders “if emails are really letters and not discussions at all, or if I could equate an email conversation as a discussion.” This important question slips naturally into the discussion as Sarah “thinks aloud” on screen. Taken further with more research experience, it could lead to an interdisciplinary exploration of writing, spoken discussion, and hybrid online communication that might result in an innovative use of research methods.

She attempts to harmonize three different frameworks: the structure that organizes her experiences, a new conceptual framework presented by Wood, and an evolving meaning structure surrounding her telementoring work. She takes his ideas, tests them against her past experience, integrates those that offer new possibilities for thinking about telementoring, and applies this new framework to various aspects of her research project.

This email message is an important moment in the development of Sarah’s research thinking. She uses some of the language of research: “data collection,” “initial hypotheses,” “assumptions as a researcher.” In her mention of relationship building and trust we see the seeds of her final report, titled “Building a Relationship in a Virtual Setting.” She seems to have identified more specific questions for her inquiry: What kinds of questions did she ask Corel? What was her purpose in asking them? What was their effect? Related to research methods, she considers how Wood’s ideas can help her organize her data collection and analysis. Related to her final report, she asks what types of materials need to be cited, how to do citations within the text of her report, and where to place her ideas within the report.

Most of my responses begin with a typical instructor’s affirmation (“yes”) or validation (“good idea,” “good insight”). However, in extending my responses with comments or questions, I believe my role moved beyond “instructor” toward “mentor in the community of action researchers.” As a mentor, I helped
her reframe her thinking into a researcher’s cast of mind. I identified her ideas for question categorization and her rationale for posing them as data analysis and “coding.” I suggested that her analysis of Corel’s responses would be limited without interviews of Corel and others, but also recognized the practical limitation of time. I noted that she should, as a researcher, clearly state the methodological limitations in her research report. I also encouraged her to keep probing the article using a researcher’s frame of mind.

I was impressed with her insight that the online environment might create a more level playing field for communicators. Having explored this literature, I knew that others had also concluded this. I suggested that she might peruse the literature on the differences in educational settings and add this to her literature review, after the semester was over when she had more time.

This exchange was important for me as a researcher in developing the idea of co-reflection as a collaboratively undertaken reflective process. At the end of my response to Sarah, I noted, “You’re making me rethink ‘journal’ as being a much more interactive thing, which I think is better!” I had thought of the journal assignment as primarily a tool for encouraging student reflection, giving me the opportunity to understand and comment as instructor or mentor. Sarah’s perceptiveness and probing questions invited me to be a co-learner and “co-reflector.”

Though I was probably not as deeply engaged in the process of reflection as Sarah, her insights spurred me to stretch my own thinking about the nature of questioning. I speculated that questioning might be more complex than simply having a question mark at the end of a language act, or that questions might serve a range of different communication purposes. Sarah’s thoughts about the social purposes of questioning encouraged me to think more deeply about this as well.

This episode affected the course development. Sarah’s questions helped me realize that coding would be an important part of her data analysis and Ruth’s as well, so on March 17, I added readings on coding to Module 10, which originally addressed only ethical issues related to action research.

**Dialogue on Sarah’s Telementor Role**

Probably due to the experimental nature of the high school senior project as a pilot project, as well as her own extremely busy professional life, it was difficult for the high school library media specialist, Lee, to give specific tasks and timelines that the high school students should follow in undertaking their senior
projects. In the fall of 2003, Sarah had tried to be a librarian mentor but had difficulty because she was unable to get clear guidelines on how to do this. She was also a novice librarian who had no personal experience with other students to fall back on. As researcher and coordinator of the telementoring aspect of the project, I had had similar difficulties getting clarification on the telementor role.

Sarah sent the instructor an email on March 4 for advice on how to identify her role as she was organizing her thoughts for her action research project. In my reply on March 5, as instructor, I encouraged her to value her role as mentor beyond the information literacy tasks because I believed she was making a valuable contribution to Corel’s well being despite that fact that the senior project did not seem to be progressing adequately.

As in the dialogue in the previous section, excerpts from the two emails are presented in Chart 25, integrated into a format resembling a conversation. This is followed by discussion. The icons represent a change in speaker.29

Chart 25. Sarah-Instructor Dialogue on Sarah’s Telementor Role (3/4-3/5; excerpts)

<table>
<thead>
<tr>
<th></th>
<th>Hi Joyce,</th>
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<tr>
<td></td>
<td>… When I begin to think of my questions and analyzing my data, I always go back to the fact that I’m not really acting as a teacher, yet the questions I’m posing are teacher type questions—where I compare myself as a teacher in the classroom and a teacher now online. I wonder if that is a shift in thinking I need to do or if I can still approach my research from this vantage point.</td>
</tr>
<tr>
<td></td>
<td>I think you can approach the research from the standpoint of a being a teacher. Try it and see if it needs refinement by the time you write your final report. I think Corel thinks of you as a teacher, and more specifically as an English teacher, as well as a librarian.</td>
</tr>
<tr>
<td></td>
<td>The problem also goes back to my initial feelings of being a little lost. I know I kept pestering you for clarification and that you shared everything you knew and you invited me to contact Lee. I want to emphasize that I appreciate your openness and willingness to help me at every step of the process.</td>
</tr>
<tr>
<td></td>
<td>I fully understand this feeling of being &quot;lost.&quot; I knew you felt lost, because I also felt this way, but I was at a loss to know what to do to improve the situation. There were factors at work beyond our control, and beyond my understanding.</td>
</tr>
</tbody>
</table>

29 Sarah’s icon is ☞, and the instructor’s icon is ▶️.
My initial confusion really is then my problem and I wonder if I had made more of an effort in the first weeks to meet face to face with Lee and really understand her intentions, would I have acted differently throughout the year?

I’m not sure that meeting F2F with Lee would have changed the situation significantly in regards to your confusion about the project. You would have had a better sense of who Lee is and what her role at Central is, and that might have made a difference in your understanding of the situation.

I guess I realized that the “go with the flow” mentality is something that I am uncomfortable with personally and when I thought more about why, I realized it is because I haven’t really taught with that lack of framework. I have always had goals, objects and a clear path to travel on. This is really my own weakness, but I wonder how it played into my “in-action” or my hesitancy. (I recall now that Central was hit hard with the virus early in the school year and we didn’t realize this until a few days or even one week in—this maybe slowed things down too.)

To teach with “goals, objects, and a clear path to travel on”... many teacher educators would point to you as someone to emulate! Given your admirable need for a framework and the uncertain nature of the senior project, I appreciate your patience and good will, and how well you’ve gone with the flow despite discomfort.

I’m not trying to complain and bring up issues we have already discussed because I certainly know the constant flux was/is challenging for you too. But what I was thinking was that this is a big variable when I approach my research—it seems almost contrived for me to describe my role as a mentor because I felt I wasn’t really acting with knowledge or expertise—I was just responding to Corel.

I think you can say that your role as a librarian mentor for the senior project was limited. I don’t agree when you say you weren’t acting with knowledge and expertise. It’s true that you weren’t using some of your librarian’s expertise, like helping with search strategies and finding resources. But I do think you used your English teacher’s expertise in the discussion with Corel about Shakespeare and her AP English paper. You might expand your definition of mentor. On the TeleMentoring page on the wiki, I give this definition of mentor from The National Mentoring Partnership:

“A mentor is an adult who, along with parents, provides young people with support, counsel, friendship, reinforcement and a constructive example. Mentors are good listeners, people who care, people who want to help young people bring out strengths that are already there.”

Further:

“They [the NMP] state that successful mentors: (1) have a sincere desire to be involved with a young person; (2) respect young people; (3) actively listen; (4) empathize; (5) see solutions and opportunities; and (5) are flexible and open.”

You fit that description pretty well, don’t you think?

Now, this might be entirely my fault and when I think back I know you gave me the definition of a mentor (we discussed it) and you gave me strategies for communication and you gave me Kuhlthau’s model and the invitation to email you with any questions. I didn’t use all of these resources like I should have to direct Corel or to lead her. I can see now that I should have taken a more pro-active role.
You perhaps could have been more pro-active, but I also think there were other limiting factors to this besides your intentions and actions. I don’t know what was happening at Central in Lee’s work with the students, but the senior project has not been clear to me or well structured until we received the North Newton workbook about a month ago. I could be wrong, but even if you’d been more pro-active, I’m not sure if Corel would have known how to respond.

If I think about why I didn’t do more of this I really think it is because of the internship with Bess Press. I had been sending her emails with questions about her feelings, anticipation, what she might see/do/learn etc. but on the day of her internship or the weekend before she suddenly told me she wasn’t doing it. I think that it made me really wonder--how real is this project? How seriously is it being taken by Corel and Lee? … I realized that what I had thought was happening wasn’t and I didn’t like “not knowing”--how could I serve as a mentor if I didn’t know the “rules” or expectations etc. Even then, I tried to connect with Lee at a librarian’s meeting and she was so easy going--don’t worry, things are fine … here I feel I am operating in outer space.

I fully understand what you’ve said here.

I just wanted to put this out there to you because as I’m composing my proposal, I wonder if I’m misrepresenting myself as a mentor involved with the Central senior project. I feel very distant from the Central part of the project. I do feel a bond with Corel, but I don’t think it is necessarily a mentor bond where I have helped her with her project. So as I prepare to analyze data, I just wonder where these variables fit in?

I think it will depend on what your study focus is, or ends up being after you complete the data collection and analysis. Let’s keep thinking about this and discussing it.

Discussion

This exchange is an example of the kind of emotional support the instructor gave to Sarah as she faced some of the difficulties of shaping her research project and analyzing data. Even though Sarah had been given the responsibility to act as a librarian telementor to help Corel develop her information literacy skills, there were numerous delays in the completion of important activities, such as the internship experiences anticipated for the high school students, that led to ambiguities about what Corel was doing and how Sarah should assist.

Rather than urging Sarah to continue to be a librarian telementor, as instructor and researcher, I empathized with her feeling of being at a loss about her role as a librarian and praised her efforts to continue working with Corel despite the fact that the lack of actionable “goals, objects, and a clear path to travel on” had caused her discomfort. During the fall of 2003, as researcher I had observed the email
communication between Sarah and Corel and been impressed with Sarah’s sincerity, warmth, humor, and ability to listen to and empathize with Corel. Referring to the definition of telementor posted on the Mentors Wiki, I encouraged Sarah to value her considerable strengths as a teacher and mentor. In a telephone conversation with me as researcher on January 30, 2004, and in an email to Sarah at the end of the telementoring project, Lee also indicated that she valued Sarah’s role as supportive, caring teacher more highly than the librarian telementor role.

**FINAL PAPER: ACTION RESEARCH ON TELEMENTORING**

The culmination of Sarah’s work was her final paper, submitted on May 11 (see Appendix K for the outline of Sarah’s final paper). Here, she demonstrated her skills at applying the concepts and tools of action research – noticing, reflection, validity, data analysis and interpretation, and evidentiary argumentation. Because of her nine years’ experience teaching students like Corel, she had a wealth of knowledge and understanding to draw from, in both the implementation of effective communication strategies and in the conduct of the research. She made connections, asked questions, and provided insights that an outside researcher would have had difficulty doing without a similar background and without extensive observations and interviewing. Through this research project, Sarah was able to prove to herself and argue convincingly to others in her final paper that her classroom goals could be met in a virtual environment:

> Ultimately, I realized that my goals in the classroom—to be a caring, nurturing, compassionate teacher who valued student input and the rapport between students and teacher; who provided the opportunities for student inquiry and encouraged students to take intellectual risks—were the same for telementoring. My primary way of achieving this evolved from my role as a supportive listener and co-learner in the telementoring relationship. (5/11/04)

**“Building a Relationship in a Virtual Setting”**

The title of Sarah’s paper was “Building a Relationship in a Virtual Setting.” The purpose of the study was to examine how her “method of communication, means of noticing/observation, and definition of what it means to be an effective teacher changed due to the virtual format.” Specifiically, she aimed to examine the questions she posed to the student, the rationale and purposes behind the questions, and how questions in a virtual setting might differ from questions posed in a traditional, face-to-face classroom. Sarah believed that relationship building would be “crucial in a telementoring situation”: “If the student did not feel a
connection to the mentor, she would not take intellectual risks, pose questions or share personal realizations and feelings that one is able to share in an intellectually safe and nurturing setting.”

She described clearly and concretely the nature and goals of relationship building in the classroom: “building a relationship with my students [is] a crucial step to promoting learning and a necessity for creating an intellectually safe learning environment where students felt comfortable enough to take chances with their ideas or to experiment with their writing.” This involves an interest in the student beyond the walls of the classroom: “By devoting time to getting to know the students as individuals, teachers prove to students that they are interested in them as individuals; by discussing topics that might have nothing to do with school, teachers encourage relationships based on mutual caring and common bonds.”

Sarah did this by allowing them to voice their concerns with life inside and outside the classroom and helping them channel their frustrations toward positive outcomes. The result was often greater student investment in learning tasks. This role of supportive listener enabled her to be a more effective teacher because the students were learning in “an environment in which they could feel safe—to share successes, frustrations, hopes, or fears—and could develop strategies to reflect, to listen to others, to provide suggestions for change, and to realize that through open communication, change can occur.” Sarah believed “these lessons will help students professionally and personally throughout their lives.”

She believed that the virtual environment required different strategies for relationship building due to the lack of physical and auditory nuances available in face-to-face conversations. Her study aimed to investigate these strategies. She stated that her greatest fear was being unable to establish an emotional connection: “Primarily, I feared that I would not be able to spark an emotional connection with my mentee and that if this did not occur, she would not email and our telementoring experience would fail.”

Sarah’s research questions were: (1) How did I adapt my questioning techniques from the physical to the virtual classroom? (2) What types of questions did I pose and what strategies for questions did I rely on as a telementor in order to: (a) Build a relationship in which the student felt safe to pose questions and share her ideas; (b) Perceive the students’ needs (i.e., when to validate, clarify, push, let go); (c) Encourage critical thinking; and (d) Provide space for the student to become an independent learner.
Her methodology involved coding and categorizing of the questions she had posed to Corel in her email messages, as well as Corel’s responses. In the process of coding, she realized that she needed to understand exactly what kind of relationship they were building and how it was changing. Sarah noted, “In fact, I felt there wasn’t a relationship until my professor shared her insights from reading my emails with Corel [interview, November 12, 2003]. Only then, did I begin to see how a relationship had formed.”

The coding and categorization, as well as her active solicitation of feedback from her instructor, led to major insights and an evolving framework for the analysis and interpretation.

These categories proved too broad for the time frame within which I was working. My instructor emailed me two questions to consider—how did I invite Corel to trust me? If I did more than to establish trust in the relationship, what were the things that I did? Suddenly, the analysis and organization of my data became more clear. I charted the data and analyzed it. From this organization of the data, I saw the various roles that I played emerge. This became the framework of my interim research report. (5/11/04)

More importantly, the analysis process allowed her to discover much more about Corel and the relationship she had fostered:

I anticipated I would find much information on movies and her homework for other classes. In terms of the project, I knew I would find our exchange of potential questions she could pose to a Manga publisher, but I did not expect to find much more than that. However, as soon as I returned to the emails, I noticed that we had shared much more personal information about our lives than I had recollected. I also noticed that she shared her successes and self-doubts. Later, as I began rereading and analyzing the emails, I could see so much in them—the student reaching out with ideas to be validated or the student seeking someone to listen or sharing successes and challenges. Now, I see the student’s maturity and humor. I see a sharing of conversation. (5/11/04)

“Role as a Telementor”

The specific roles Sarah played emerged as she analyzed the data: (1) supportive listener, (2) co-learner, (3) librarian, and (4) teacher. Her strongest role was as supportive listener. Her goals as a supportive listener were to build trust; to show sincere compassion, concern and commitment; and to provide the guidance and affirmation Corel would need to complete her project and feel successful. She drew on her classroom experience to achieve these:

I drew on strategies I had found to be successful in my classroom—sharing anecdotes from my life, sharing silly stories from my children’s lives, posing questions based on something I heard the students say, admitting my errors or frustrations, making connections to the classroom and the outside world and providing time in class for laughter. These strategies show the students that I respect them enough to share my personal world with them and I think that students begin to realize that they are not alone in their learning—teachers are people who are struggling to learn how to teach, how to parent, or how to learn. With Corel, I shared the finalization of my daughter’s adoption, my son’s
interest in Captain Underpants books and my frustrations with my principal questioning a Shel Silverstein illustration on my Freedom to Read Display. (5/11/04)

Questioning strategies were also important to Sarah in this role. She used questions to show an interest in and solicit information about Corel, follow up on topics Corel had mentioned, help her consider alternatives, and solve problems:

I attempted to achieve the goals of a supportive listener by posing questions related to her project, classes, job, or personal interests. Frequently, I found subjects she introduced in an email that could be reconsidered or elaborated on—these were questions I posed as well. She emailed me about an emerald ring she would wear as part of her prom ensemble and I asked her the story behind the ring—a gift? a family heirloom? I agreed with things she told me in the emails and shared personal anecdotes that connected to subjects she shared so we could see some common bonds. She expressed frustration about balancing her daily work schedule at a public library with her homework. I asked her if she could cut back her hours or at least take a day off. I acknowledged that she sounded very busy and needed to take some time to do something “fun.” Whether or not I felt she was procrastinating with her project, I wanted to know that I heard her frustrations and that I understood where she was coming from. I tried to ask questions that could help her consider alternatives to her predicament. (5/11/04)

Sarah notes that her perception of Corel changed as she compiled the data — from a student completing a senior project to a complex, mature young woman:

During the initial months of the project … [My] fixation on what I did not know in terms of my definition as mentor and the extent to which I should be critiquing her led me to overlook the birth of our telementoring relationship. Corel was sharing insights, thoughts, fears and feelings with someone she thought was listening attentively. Only now do these little comments stand out to me as indication that Corel is a complex young woman who had begun to feel comfortable communicating openly in our emails. (5/11/04)

The second role Sarah took was as a co-learner with Corel. Both were learning about how to use the wiki, and both were negotiating an entirely new kind of relationship – telementoring. She notes that, while there may have been ambiguities about their online identities and how to address each other, she perceives an “acknowledgment of identities”—“respect, understanding, and an acknowledgment of each other’s words and feelings.” Although Corel did not use greetings in her messages in the later period of the relationship, she empathizes with Sarah’s frustrations, concurs with her opinions, and shares stories from her own life related to events in Sarah’s life. Sarah comments:

So rather than read the lack of greetings as disrespect or distance, I see Corel jumping into the conversation with her ideas. One question that emerges then: Is it the medium that lends itself to the informality? Does the telementoring relationship break down the role of teacher as all-knowing and student as recipient of the knowledge? This is one area that I feel I need to examine more at another time and with Corel’s input. (5/11/04)
The third role Sarah took was as librarian, the one that she adopted least often. She speculates that the reasons for this could have been her inexperience as a librarian and/or Corel’s access to her school librarians for direct, face-to-face contact. In her role as librarian, she helped Corel formulate questions for her career mentors, revise her project proposal, and reconsider her ideas and writing style with a specific audience in mind.

Although Sarah’s fourth role – as teacher – was the one she felt most comfortable with, she often relinquished that role in favor of supportive listener due to the ambiguity of the senior project framework. As teacher, her communication style changed: “When she asked me to give her feedback on her proposal, I felt myself move into my teacher mode and while I phrased my suggestions for changes carefully, I could see that I had left the chatty telementor behind.” She explains her struggles to critique Corel’s proposal without clear guidelines as to her role or the opportunity to help shape the learning experience:

While I saw myself falling into certain roles, the definition of a telementor was never specifically outlined at the outset. So, a few months later when Corel sent me a second draft of her proposal, I was disappointed to see that she had not accepted some of my suggestions for changes and even more perplexed as how to address the need for changes. At the urging of Corel’s school library media specialist, I did critique the proposal again, but I felt uncomfortable doing this. Whereas in the classroom I would have provided my students with models, opportunities for peer editing, and specific strategies to strengthen their writing before I assessed them, I felt I was being asked to put teacher comments on her paper before she had the opportunity to engage in the writing process.

(5/11/04)

Under normal classroom and library circumstances, the supportive listener activities occur within the teacher/librarian roles, not separate from them. Sarah’s telementoring of Corel is a special case that needs clarification. In her final paper, Sarah identifies her supportive listener role as separate from the other roles. Under Sarah’s normal classroom circumstances, it seems likely that she would not consider these separate. However, in the telementoring project, the expectations of her as a librarian and teacher were not clear, and specific guidelines on how she should fulfill these roles were not given until the supervising librarian provided the graduate student mentors with copies of another’s school’s senior project workbook on February 4, 2004. Sarah’s supportive listener role, which had begun in September 2003, was already well established by then. It was perhaps the lack of activity and data about the teacher and librarian roles that led the supportive listener role to stand out as separate in Sarah’s mind, rather than being subordinated to the other roles.
"Reflections as a Researcher"

Sarah’s first and most important conclusion was that she had successfully built a multifaceted relationship with Corel solely online. This was confirmed by the two school library media specialists at Corel’s school, who independently emailed Sarah to express gratitude for providing a strong teacher connection for Corel, listening, supporting, advising, and being someone that Corel reached out to. Both librarians noted that this was unusual for Corel. Sarah notes, “Possibly, my goals to be a caring, nurturing telementor were met.”

Sarah also describes her struggles over the lack of definitive guidelines for her role as telementor. She was concerned that she was not adequately guiding Corel toward her end goal, while at the same time being confused over what exactly that goal was. She struggled emotionally to remain interested in the senior project, although her interest in Corel never waned. She struggled with balancing her four roles and the differing communication styles they seemed to require. She concludes, “Ultimately, I believe that the school library media specialists and I needed to establish some parameters rather than to let the process define itself.” She provides specific recommendations in the conclusion of her report.

In reflecting on the action research process, Sarah states that she realized she was not the independent learner she had perceived herself to be:

Formulating the questions, outlining the study, collecting and analyzing the data forced me into a realm that I had not faced previously in my education. My college courses had encouraged critical thinking and discussion, but this fell under the framework of the course as outlined by the professor’s inquiry—not the individual student’s. While I created unit plans, lesson plans and assignments for my students that tapped on my creative and critical thinking skills, those assignments seemed more finite—within the framework of the standards or with the intention to teach students a specific skill. The vast possibilities of this project intimidated me and overwhelmed me. There were times when I floundered, unsure of my questions, my insights, and my analysis. I continually wanted “the answer” and I wanted validation from my instructor. How ironic that I expected my high school students to construct their learning when I was feeling unable to do the same. (5/11/04)

Given the complexity of the multiple tasks and challenges Sarah faced as a novice undertaking the action research course—telementoring a high school student without clear guidelines, learning the concepts and tools of action research, planning and conducting research, and presenting a final report of findings—it would seem surprising indeed if she were not intimidated or overwhelmed. One might instead fault the instructor for placing heavy burdens on the students of such a course. Nonetheless, Sarah’s comment raises a critical question about teacher education: Are we adequately preparing teachers and school library media
specialists to support inquiry learning among students without first supporting their own inquiry learning through such means as action research?

"Conclusions, Recommendations, and Future Action"

Sarah concludes her report with recommendations for the continuation of her research, improvements to the senior project, and a better telementoring process. Regarding her further work on this research project, Sarah intends to revise and narrow her focus, devote more time to data analysis and interpretation, revisit her role as librarian, seek input and multiple perspectives from others within and outside of the project, and reorganize the presentation of findings.

Sarah also presents critical initial questions to be answered by teachers, school library media specialists, and curriculum planners considering the implementation of a senior project and utilizing telementoring support.

Planning the Senior Project:

- What is the rationale behind offering the senior project, how will the course be implemented, and how will students demonstrate mastery of the expected culminating tasks?
- In what ways does this senior project culminate the students’ high school experience?
- Who are the primary people responsible for the implementation of the senior plan, for defining the culminating tasks, and for assessing student learning?
- Does the senior plan provide freedom for students to pursue their own interests while providing necessary structure to scaffold the assignments and dictate a clear timeline?
- How will mentors be located for each student? Can mentors handle more than one student?

Planning Telementoring:

- Does the telementor understand the scope and sequence of the senior plan and has he/she been informed of the expectations of the project?
- What is the telementor’s role? Will he/she assess the student or will the role be more of supportive listener?
- Does the telementor have the time to email, read emails and “process” the emails so as to read a variety of meanings into the student’s writing?
- How frequently and by what means will the telementor contact the teachers or school library media specialist?
- How can the telementor gauge the development of the relationship while it is developing?

Finally, Sarah addresses the crucial factor of time: “while I am used to maintaining a roster of 165-180 students, planning the lessons, assessing their work, and differentiating materials to meet the needs of various students, I found telementoring one student to be time consuming. To phrase simple emails so as to acknowledge Corel’s immediate interests and yet to propel her to examine her project more carefully
required time many teachers do not have to spare." The success of Sarah's relationship building efforts
seems clear. The time-consuming nature of her efforts seems equally clear. Both results stem from her
knowledge, understanding, and wisdom as an experienced teacher. This is a cautionary note to the belief
that distance education is a time-, energy-, and cost-saving means of delivering learning opportunities.

Sarah's final report gives clear evidence of that she used a combination of four kinds of reflection
during the course: (1) technical reflection (Van Manen, 1990), (2) practical/deliberative reflection (Van
Manen, 1990; McKernan, 1996), (3) psychological reflection (Mason, 2001), and (4) social/critical
reflection (Mason, 2001; Van Manen, 1990) in working toward the effective attainment of her goal to
become a more effective and sensitive online teacher. Technical reflection focuses on examining skills,
strategies, and methods used to reach predetermined goals according standards derived from external
authority. Sarah sought to understand and practice action research using the course readings, questioning
other participants for clarification and new insights, and seeking validation from the instructor.

Practical/deliberative reflection focuses on the methods to reach goals and also on examining the
goals themselves. As a telementor, Sarah aimed to use her librarian’s skills to help Corel complete her
senior project. Her difficulties in accomplishing this apparently blocked her from perceiving that she had
been fulfilling a different role – that of supportive listener. “During the initial months of the project …
[My] fixation on what I did not know in terms of my definition as mentor and the extent to which I should
be critiquing her led me to overlook the birth of our telementoring relationship.” As she worked through the
data analysis, she began to see that she had played a vital role in Corel’s life that perhaps other teachers did
not. She saw Corel in a new light: “Corel was sharing insights, thoughts, fears and feelings with someone
she thought was listening attentively. Only now do these little comments stand out to me as indication that
Corel is a complex young woman who had begun to feel comfortable communicating openly in our
emails.” When Corel was in the final stages of completing her proposal toward the end of the semester,
Sarah struggled over which role to take. In the end, she valued her supportive listener role over the roles of
librarian and teacher that she had initially felt she was charged with.

Psychological reflection is a movement inward toward self-awareness, sensitizing oneself to notice
situations in which alternative actions are possible, and changing practices by changing one’s view of
oneself. Sarah investigated her strategies as a telementor and concluded that her role was different from what she had anticipated before data analysis. More importantly, she realized disconcertingly that she was not the independent learner she had believed herself to be. This led her to use the fourth type of reflection – social/critical reflection. Social/critical reflection questions the broader moral, ethical, and social assumptions underlying the goals, resulting in a call for change or reform. This resulted in a critical analysis of the senior project and the telementoring intervention.

**SARAH’S FINAL COURSE COMMENTS**

*Ranking of Course Activities*

Before her final interview on June 17, Sarah was asked to complete a questionnaire and bring it with her to the interview. She found it difficult to rank the course activities and did not complete the questionnaire in writing, so we discussed the questionnaire items during the interview. In Chart 26, the course components are listed in the order discussed, with main points quoted or summarized.

**Chart 26. Sarah: Importance of Course Activities for Learning**

<table>
<thead>
<tr>
<th>Course Activity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telementoring your mentee</td>
<td>“Loved” telementoring Corel; helped her see her strengths as a teacher (supportive listener), and gaps as a librarian; reinforced that the information process is similar for all learning levels; everything was too new and information was difficult to absorb, so she failed to use the Kuhlthau model, but now sees its usefulness, particularly the affective part.</td>
</tr>
<tr>
<td>Weekly assigned readings</td>
<td>Felt lost at the beginning, not able to see the big picture; early example of an action research article would have been helpful; Mason readings were too philosophical, as she is a very concrete person; really liked the Ball article on insider research – the first article that really connected.</td>
</tr>
<tr>
<td>Independent readings for your research project</td>
<td>Wood article (suggested by instructor) on questioning strategies was very helpful; most of the independent readings were done at the end when writing her final paper, due to lack of time; articles from <em>Educational Leadership</em> were reaffirming to her as a teacher and helpful to her as a librarian.</td>
</tr>
<tr>
<td>Writing your weekly module assignments</td>
<td>“It forced me to think, and to come up with an answer, and to try to really say what was happening with my thinking this week. So it was really good that you had those questions, and that you asked us to write questions, because otherwise, I think I would have just come [to chat] not really knowing as much, or not really willing to say very much … when I go to my library classes, I’m a listener.”</td>
</tr>
<tr>
<td>Journals</td>
<td>“I really like journaling and I don’t know why I was do delinquent with that. But yet when I sat down to do it, I felt like I had some different ‘aha’s’ and I remember getting excited.”</td>
</tr>
</tbody>
</table>
Chart 26. (Continued) Sarah: Importance of Course Activities for Learning

<table>
<thead>
<tr>
<th>Activity</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chat</td>
<td>&quot;They were really interesting in that I could see how Ruth and I were just seeing things so differently ... The chat did help me understand what was important in the reading, how it connected to what we're doing, how we can use this information ... And it was wonderful to be able to meet via chat because I didn't have to drive down to UH.&quot;</td>
</tr>
<tr>
<td>Email with instructor</td>
<td>&quot;Email with you was so good because you just kept me energized, and encouraged me, and you gave me things to think about, and I really appreciated how quick the turnaround was. You were there. I thought that must have been so time consuming for you to address all my emails, but I really valued that. And I think that you just kept me going ... I really need that reinforcement. I didn't know that. So that was really helpful. Helpful too when you pointed out little things [that] I had missed with Corel ... At one point you told me that I kind of turned the emails into journals, I think that as I was typing there I was thinking and things were happening.&quot;</td>
</tr>
<tr>
<td>Research project</td>
<td>&quot;The research project. Oh, wow, that was really overwhelming for me ... The role it played in my learning? ... When I started looking at this [questionnaire], I thought I just can't bear to go back online. It's my own fault, because I didn't break it down and do a little bit each week. And even if I was faced with another project right away ... I don't want to go back and do research online. I just want to have a bunch of books and just sit with books.&quot;</td>
</tr>
<tr>
<td>Face to face meetings</td>
<td>&quot;The face to face meetings at my high school were really helpful ... I liked that. I think it was important to have those face to face times ... It was neat that you had activities for us those times. Different from just the opening chat or just speaking to the questions. I liked that.&quot;</td>
</tr>
<tr>
<td>Other</td>
<td>&quot;I just felt like I don't want to face another computer again. So that's kind of funny. So even though I can do it, and I liked the class that way, I just feel tired of the computer ... And I felt I needed a lot more practice and more exercises.&quot;</td>
</tr>
</tbody>
</table>

In the final face-to-face class session on May 8, Sarah made additional comments about the course, noting that she appreciated the flexibility as well as the structure and gained from co-reflection with others:

If you had been really vigilant about the due dates and about when we needed to do each step of the process, I think I wouldn't have come to some of the understandings I did now. Because you were more flexible ... I mean you kind of let me experiment with some things, but I don't think you graded each step along the way. I think that it's only now when I'm writing this [paper] up that I'm starting to understand how the pieces all fall together. You know how we keep saying that we're teaching each learner at their own pace? This class really taught me that. I liked the freedom. I think the project planner would give structure but still ... in a non-threatening way ... I like the different outlets you had ... the different opportunities for learning. The individual reading and then coming to the discussion each person bringing questions and sharing, because I think we had really different personal opinions. That was a really important part of the course. (5/8/04)

**Most Important Learning: Relationship Building**

When asked via email about the single most important thing she had learned during the semester, Sarah responded (email message, July 7), "As a teacher, I learned that I can build a relationship with a student in a virtual format. ... Maybe this is the most important for me." Her responses to the question of the five
most important discoveries she made during the semester are listed in Chart 27 in the order found in her email message.

**Chart 27. Sarah: Most Important Learning**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Important Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aha #1</td>
<td>As a student, I learned that I like the virtual format for my learning. I liked that I could go back to read our chats or return to email &quot;discussions.&quot; I appreciated having the course &quot;texts&quot; online and in PDF formats. I really liked putting my work in the wiki once I finally learned how to do it.</td>
</tr>
<tr>
<td>Aha #2</td>
<td>Also as a student I appreciated your encouraging, patient, supportive role. You gave me space to flounder yet you also gave me words of support when you saw that I needed them. While you probably saw some glitches and errors in my process, you gave me space to learn at my own pace. I felt valued as a student and I think this is crucial for learning to occur.</td>
</tr>
<tr>
<td>Aha #3</td>
<td>I also became aware of my limitations as a student and these a-ha's will help me to be a better teacher to teachers and to students. For instance, you put information on the wiki or I read articles for assignments, but the information maybe didn't click or become &quot;meaningful&quot; for me until I needed it later in my paper. I used to think that if somebody is exposed to something, they will remember/learn/use it. So wrong--there is so much information to process that I see now people grab onto what is meaningful to them and use that and might not even recall being exposed to other issues/ideas. As a librarian, I need to remember this especially because teachers aren't in tune with information literacy etc. I will need to find novel ways of reintroducing info. lit. without becoming repetitive.</td>
</tr>
<tr>
<td>Aha #4</td>
<td>As a librarian I realized that I am still learning and growing. Although I knew the research process, my tendency to procrastinate got in the way of good intentions. I also see that I revert to my teacher self more than my librarian self. By this I guess I mean I spent a lot more time building the relationship and worrying about the assessment--how to look at the end product in terms of content--rather than considering how we could get there (the process of determining Corel's info. needs etc.)</td>
</tr>
<tr>
<td>Aha #5</td>
<td>I now see teacher research as an important part of teaching. I feel capable of doing teacher research.</td>
</tr>
</tbody>
</table>

When asked during the final interview (6/17/04) if and how her experiences during the semester had changed her perception of herself and of "the world," she responded, "It validated what I've been doing intuitively and informally. It gave me a positive attitude about professional development. I just think it validated so many little things with my practice that are important," such as "gathering information and assessing what I'm doing with my students" and "looking for validation from other professionals and from the literature." She could now see that "to become a better teacher one needs to do it a little bit more formally."

She noted that her high school's professional development program was definitely pushing her to be more purposeful in her reflection, assessment, growing, and learning, but there was a sense of "just going through hoops." The course helped her see the program's credibility and as a result, she tried to "have a
better attitude about the whole professional development aspect at school.” One of her major questions was “how do you get all the other teachers who are tired and feeling overworked and everything, to believe and buy into it?” She felt that a support system was necessary but ultimately it depends on self-motivation.

**Learning from Readings and Modules**

In the final questionnaire, Sarah was asked to rate the course readings according to meaningfulness, difficulty, helpfulness, and resonance with personal experience. Rather than using the questionnaire, these were discussed during the final interview (6/17/04). The most meaningful readings were those on insider research (Ball, 2002) and the Strauss and Corbin (1998) readings on grounded theory coding. The readings most difficult to understand were those by Mason (2001), which were “too philosophical,” and the readings on claims and warrants (Booth et al., 1995), as she felt she needed more concrete examples and exercises. The readings that resonated best with her own experiences were, again, Strauss and Corbin, as well as Lofland and Lofland (1995) on writing and presenting findings. The Mason readings were the least helpful.

In general, her answers highlight the following themes: (1) the importance of connecting theory to practice; (2) the importance of rooting the abstract in concrete experience; and (3) the value of one’s background, previous experience, and individual talents as bridges to new learning.

In the final questionnaire, Sarah was asked to rate the course modules according to the following questions, which we instead discussed during the final interview: (1) In which modules did you feel you made the best progress in learning this semester? Please describe why you chose each module to answer this question. (2) In which modules did you feel you made the least progress in learning this semester? Please describe why you chose each module to answer this question. In addition, Sarah also provided information about her responses to the modules in her chat review journal entry (May 4). Her combined answers highlight the following themes: (1) the influence of affect (positive and negative) on the research process; (2) focusing the research question as one of the most difficult stages of the process; (3) the importance of connecting theory to practice and rooting the abstract in concrete experience; and (4) the value of one’s background, previous experience, and individual talents as bridges to new learning. Sarah’s comments on the modules are summarized or quoted from the final interview (6/17/04) and the chat review journal entry (5/4/04) in Chart 28. While some of this information duplicates what has been discussed
previously, it is provided again here to allow readers who wish to do so to make a direct comparison with Ruth’s case.

Sarah’s final comment in the chat review was positive and reaffirming: “the 699 has validated things that I do as a teacher—reflection, seeking the input from others, taking time to improve my practice, considering how I might share my experiences with others to help them in their teaching.”

Chart 28. Sarah: Evaluation of Modules

<table>
<thead>
<tr>
<th>Category</th>
<th>Modules</th>
</tr>
</thead>
</table>
| Modules in which you feel you made the most progress | M4 “Insider Research” – “The Ball (2002) article ... was the first one I remember really thinking, ‘Wow, okay, I get this.’” (6/17/04)  
M10 “Ethics/Coding to Theory Building” – “Creating categories seemed very natural to me and asking ‘what is going on here?’ seemed like something I did naturally as opposed to some of the other exercises we did. It was like reader response theory. The coding made sense to me. I liked that, so that started to energize me a little. That’s why I had a lot of fun on the wiki, too, putting the coding in different colors.” (6/17/04)  
M11 “Researching Differently [Study Evaluation]” – “In looking for all the elements of what we have been working on in another researcher’s work I was able to connect some dots and actually see some parts of the writing that I thought demanded more explanation or other considerations. This was a little empowering for me. Also, from the examples provided I could see that I was capable of producing this type of writing— I can speak about what happened, how I examined it and what I think it means.” (5/4/04) |
| Modules in which you feel you made least progress, or were most difficult | M1-M2 “Noticing as Inquiry”; “Impartial Observation” – “I felt lost at the beginning; I remember having a big mental block about what does it mean; for me, Mason was too philosophical.” (6/17/04)  
M5 “Research Proposals” - “Selecting the topic and forming the questions was difficult. I’m still not happy with my work and rather than face my failures, I just neglected them and now, as I think about writing the paper, the weak proposal seems to be a real detriment.” (5/4/04)  
M7 “Data “Analysis” – “This section was confusing for me at the time because it required me to think about vocabulary and definitions that were out of my realm of experience. I even forgot entirely about this section because it was so tricky for me at the time.” (5/4/04)  
M9 “Claims and Warrants” – “This was one of the hardest sections for me—both in understanding the reading and creating my own claims and warrants. When I asked Joyce if the claim was just like a thesis sentence, then things started to click for me—again, I needed the simple vocabulary. I felt I needed a lot more practice and more concrete examples. I needed something that related to the classroom. That’s something that I felt never really gelled for me.” (5/4/04) |
| Other comments | “My mind was too muddled with the immediate concerns of the assignments and I didn’t know what questions to ask Joyce. I think time figures into this and my inability to process information quickly. I think my hesitancy to face my failures and misunderstandings just caused them to magnify. Now I know the process and I know my tendencies/weaknesses so next time I would hope that I could change my ways.” (5/4/04) |
**Telementoring a High School Senior**

As discussed extensively in previous sections, Sarah’s telementoring work led to her most important learning during the semester: “As a teacher, I learned that I can build a relationship with a student in a virtual format.” Despite the fact that, according to her school’s librarians, Corel had trouble forming strong relationships and did not take initiative to do things without reminders, Sarah had succeeded in forming a relationship in which Corel not only regularly took the initiative to email Sarah without prompting but more importantly “shared insights, thoughts, fears and feelings.” As a researcher, the process of coding and interpretation sensitized Sarah to notice new things and led her to change her view of Corel. Her final paper presents a detailed and intimate look at her questioning strategies and efforts to build a virtual relationship that is instructive to others who wish to use telementoring for learning support at the high school level. In addition, her recommendations for initial considerations for the senior project and the telementoring process are useful guidelines for educators planning similar programs.

**Online Communication and Learning**

In the final interview (6/17/04), Sarah commented on various aspects of the technology and course presentation on the wiki. These are quoted in Chart 29 below.
## Chart 29. Sarah: Comments on Online Communication and Learning

<table>
<thead>
<tr>
<th>Item</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module questions</td>
<td>&quot;It was really good that you had those questions, and that you asked us to write questions, because otherwise, I think I would have just come [to chat] not really knowing as much, or not really willing to share ... when I go to my library classes, I’m a listener. I go to listen to others.&quot;</td>
</tr>
<tr>
<td>Convenience</td>
<td>&quot;The online communication benefited me the most in the sense that I really appreciated being able to get on whenever I had time to get on, I didn’t have to travel.&quot;</td>
</tr>
<tr>
<td>Wiki technology</td>
<td>&quot;At first the wiki was tricky for me. It’s so easy. I had problems with my computer, and then ... you know, like people talk about writer’s block. It’s looking at the screen and thinking, “well, what am I going to put in that space?”</td>
</tr>
<tr>
<td>Chat</td>
<td>&quot;[J]ike coming into a face to face, the chat did help me understand what was important in the reading, how does the reading connect to what we’re doing, how can we use this information? ... And I think for me it was really wonderful to be able to meet via chat, even though it was slower and maybe we didn’t accomplish as much as maybe you would like to. I’m just am glad that I didn’t have to drive down to UH. And then too sometimes, because of the pace of the chats, even though slow (sometimes I felt like I was waiting, waiting, waiting for the answers), I could go back into the article and think, ‘What was the quote that Joyce or Ruth just said?’ I could go back and look and see, ‘oh, I kind of missed that in the reading,’ ... whereas face to face I might have been a little embarrassed to do that like it’d be disrespectful, or we’d be going faster so I wouldn’t have a chance. So that was kind of neat in the chat to do that.”</td>
</tr>
<tr>
<td>Course organizer tables</td>
<td>&quot;You have those things labeled very clearly in one of those grids when you go to the 699 pages. That was very helpful.”</td>
</tr>
<tr>
<td>Course pages</td>
<td>&quot;All the different pages were helpful. I really liked the chat summaries, and we talked about how in the future you might have people summarize or comment on the summaries ... The evaluation rubrics were good, too. Everything that you put up in March were helpful things. They were all really helpful to me at different points.”</td>
</tr>
<tr>
<td>Readings online</td>
<td>&quot;I really liked how the readings were accessible online. You gave us a packet at the beginning, but we could just get them there online.”</td>
</tr>
<tr>
<td>Other resources / &quot;By Request&quot; page</td>
<td>&quot;You know the different resources you gave to us? I looked at the different ones ... action research networks, or online papers, or things on telementoring ... but at different points I’d start to look at it and ... it wasn’t meaningful to me at the time. I’d think, ‘Oh, I’ll look at this later.’ I guess I just felt overwhelmed with different things. So the one that was most important to me there was the By Request because you put things up there that were related exactly to what I was doing.”</td>
</tr>
</tbody>
</table>

**Instructor**

On the final questionnaire, Sarah was asked to assess the effects of the instructor’s actions on her learning during the semester. She discussed these during the final interview (6/17/04). That Sarah discussed this with the instructor should be considered when weighing her answers, quoted in Chart 30.
Chart 30. Sarah: Evaluation of Instructor

<table>
<thead>
<tr>
<th>Question</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>What things did the instructor do that were most helpful to your learning?</td>
<td>“I really liked how patient you were and encouraging, and how you asked me good questions to get me to think about things, I like how you took so much time to respond to my journals or the emails, and I always felt that you were really thinking and looking at things, and that your perspective was so helpful to me.”</td>
</tr>
<tr>
<td>What things did the instructor do that were least helpful to your learning?</td>
<td>“There’s nothing that you could do differently.”</td>
</tr>
<tr>
<td>What could the instructor have done to help you learn better?</td>
<td>“The only thing ... to help me learn better, because I did procrastinate so much, would be to make me go to those different parts of the wiki, or to the different readings ... the really practical readings on action research.”</td>
</tr>
</tbody>
</table>

RESEARCH CASE ANALYSIS

Statistical Summary of Course Activity

Though statistics are only gross indicators of learning activity, they provide an overview of relative volume of activity in different categories and are a useful supplement to the student narratives and self-reports.

Course Activity

In the context of all course activity, Sarah’s interactivity stands out. Her email messages to the instructor constituted 32% of all she produced during the semester, more than her second most productive activity, journaling (20%). Her journals were also an opportunity for dialogue and co-reflection. The combined total of LIS 699 related email messages and journal entries comprised over half of all words that Sarah produced. Course email refers to email messages Sarah and the instructor exchanged related to the LIS 699 course. Telementoring email refers to messages Sarah sent to her high school mentee and other adults connected to the telementoring project, excluding the instructor. Module work refers to assignments and discussion questions done for the weekly modules. Though the research proposals and final papers underwent revisions, only the numbers of words for the final versions are included in Table 3.
Table 3. Sarah: Total Volume of Course Activity
(In number of words estimated from QSR text units)

<table>
<thead>
<tr>
<th>Sarah’s Course Activity</th>
<th>Words</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>699 Course Email</td>
<td>24,090</td>
<td>32%</td>
</tr>
<tr>
<td>Telementoring Email</td>
<td>2,920</td>
<td>4%</td>
</tr>
<tr>
<td>Chats</td>
<td>9,780</td>
<td>13%</td>
</tr>
<tr>
<td>Journals</td>
<td>15,270</td>
<td>20%</td>
</tr>
<tr>
<td>Module Work</td>
<td>9,520</td>
<td>13%</td>
</tr>
<tr>
<td>Research Proposal</td>
<td>1,120</td>
<td>1%</td>
</tr>
<tr>
<td>Final Paper</td>
<td>12,720</td>
<td>17%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>75,420</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Online Interaction

Table 4 summarizes the content of the email messages exchanged by Sarah and the instructor, including journal entries. In Sarah’s case in particular, her email messages and journal entries tended to blend together. Course business refers to procedural aspects such as scheduling, how to use the online tools, and clarification of assignments. Action research refers to general topics such as impartiality, objectivity, claims and warrants, and ethics not specifically applied to the student’s action research project. Research project refers to issues related specifically to the student’s research project. Telementoring refers to correspondence we exchanged related to the high school telementoring activity. Personal refers to the sharing of personal activities outside the course.

Table 4. Sarah-Instructor Email/Journal Exchanges by Content
(In number of words estimated from QSR text units)

<table>
<thead>
<tr>
<th>Email / Journal Content</th>
<th>Sarah to Instructor</th>
<th>Instructor to Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Words</td>
<td>% of Total</td>
</tr>
<tr>
<td>Course business</td>
<td>6,430</td>
<td>17%</td>
</tr>
<tr>
<td>Action research</td>
<td>3,920</td>
<td>11%</td>
</tr>
<tr>
<td>Research project</td>
<td>16,310</td>
<td>44%</td>
</tr>
<tr>
<td>Telementoring</td>
<td>8,680</td>
<td>23%</td>
</tr>
<tr>
<td>Personal</td>
<td>1,650</td>
<td>4%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>36,990</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Sarah and the instructor were fairly evenly matched in terms of numbers of words they sent to each other, although Sarah sent more words than the instructor did related to her telementoring with her high
school student, and the instructor sent more words related to course business. The topic of the most voluminous category of the exchanges was Sarah’s research project. As Sarah was writing her final report, she and the instructor actively discussed questions and ideas via email, often several times a day.

**Sarah’s Most Significant Learning Sub-Narrative**

Sarah’s learning experiences in the course were complex and multilayered, shaped by several important narratives within the primary narrative of learning action research. Using her self-reports, as researcher I identified Sarah’s most significant learning sub-narrative as the building of a virtual relationship with her telementee (discussed above). The plot of this narrative is in essence the seven key features of reflection: (1) being confronted with a challenging question or situation – a perceived inability to help Corel successfully complete her senior project; (2) dealing with feelings/emotions related to the challenge – fears about being unable to help Corel achieve her goals, frustrations over the ambiguity of her role as a telementor, and the pleasure of exchanging ideas, experiences, and feelings with Corel; (3) bringing experience into the thinking/reflecting process – utilizing her experiences as a high school teacher to understand Corel and to see how she had transferred her teaching goals and interpersonal strategies from the classroom to the virtual setting; (4) reframing perspective through bridging the concrete and the abstract – examining the evidence with a researcher’s eyes to identify other telementoring roles: supportive listener, teacher, co-learner; (5) making a leap of thinking – recognizing that relationship building in her supportive listener role, not coaching information literacy skills in her librarian role, was the achievement to be valued; (6) integrating the new knowledge cognitively and affectively – accepting and valuing her most important role as supportive listener; (7) with implications for future action – recommending revisions to her research project and action steps for more successful future telementoring and senior project programs. The turning point in this narrative is making a leap of thinking, which indicates a learning transformation. This is highlighted in the following chart summarizing the narrative.
### Chart 31. Sarah: Summary of Reflection Sub-Narrative

<table>
<thead>
<tr>
<th>Seven Key Features of Reflection</th>
<th>Sarah's Story of Learning a New Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being confronted with a challenging question or situation</td>
<td>Perceived an inability as an online librarian to help Corel complete her senior project</td>
</tr>
<tr>
<td>Dealing with feelings/ emotions related to the challenge</td>
<td>Fear of failure; frustration over the ambiguity of her role as a telementor; pleasure in exchanging ideas, experiences, and feelings with her telementee</td>
</tr>
<tr>
<td>Bringing experience into the thinking/reflecting process</td>
<td>Examined the communication through her experiences as a classroom teacher to understand Corel and recognize how she had transferred teaching goals and interpersonal strategies from the classroom to the virtual setting</td>
</tr>
<tr>
<td>Reframing perspective through bridging the concrete and the abstract</td>
<td>Examined the evidence with a researcher’s eyes and identified other telementoring roles - supportive listener, teacher, co-learner</td>
</tr>
<tr>
<td>Making a leap of thinking</td>
<td>Recognized that relationship building, not coaching information literacy skills, was the achievement to be valued</td>
</tr>
<tr>
<td>Integrating the new knowledge cognitively and affectively</td>
<td>Accepted and valued her most important role as supportive listener</td>
</tr>
<tr>
<td>With implications for future action</td>
<td>Recommended improvements for more successful future telementoring and senior projects</td>
</tr>
</tbody>
</table>

Relationship building was the focus not only of Sarah’s research project on telementoring but it was also a central force in her online learning about action research. Relationship building is the foundation for and the means by which co-learning, collaborative reflection (co-reflection), and co-construction of knowledge are achieved. Sarah was an active learner and used all the resources available to her to further her understanding about action research and complete her research project. The most important tool she used was co-reflection, which deepens understanding and alters perspectives. The affective dimension was a key factor both in relationship building and in Sarah’s research process.

According to transformative learning theory, learning occurs through four types of transformation: elaborating existing frames of reference, learning new frames of reference, transforming points of view, or transforming habits of mind. Sarah experienced all four. She elaborated her existing view of reflective practice and professional development by making connections to action research, resulting in greater commitment to her school’s professional development program. She learned new frames of reference, such as data analysis and evidentiary argumentation, by drawing from her experiences with reader response theory as an English teacher. She changed her point of view about her telementee as a result of her research.
project, discovering a young woman of mental maturity and complexity. Lastly, she changed her view of
herself, discovering that she was not the independent learner she had believed herself to be. This led her to
look for reasons both within herself and in the educational system of which she was a product:

As I was learning the methods, expectations and vocabulary of action research, and applying this
information to my study, I realized that I was not the independent learner I had perceived myself to be. Formulating the questions, outlining the study, collecting and analyzing the data forced me into a
realm that I had not faced previously in my education. My college courses had encouraged critical
thinking and discussion, but this fell under the framework of the course as outlined by the professor’s
inquiry—not the individual students. (5/11/04)

The concepts of action research and the relatively abstract way in which these concepts were initially
presented may have contributed to her inability to cope, and her feelings of inadequacy concerning herself
as an independent learner. She was faced with the ambitious task of understanding action research and
applying it to her telementoring work. In action research, the primary instrument of data analysis and
interpretation is the researcher herself. In her writings throughout the course—beginning with discussions
of key action research concepts to the study evaluation and the final report, Sarah provides evidence that
she had a competent grasp of action research concepts and methods and was able to apply these skillfully to
her first research project. By the end of the course, she had transformed herself into a skilled and competent
novice action researcher. Sarah hints that she understands this: “But ironically, you know you had given me
the Jeffrey Glanz book early on. I remember flipping through it … it didn’t really make much sense. And
then, near the end, when I was even working on the paper, I think when I was about to return to book to
you, I happened to open it up again, and everything made perfect sense” (6/17/04).

Sarah’s comments about the effects of the traditional educational system on herself as an independent
learner are highly relevant to issues currently being debated about the implementation of standards-based
learning and assessment. This raises a critical question: How can we expect students who are educated to
receive knowledge to be willing and easily able to initiate, sustain, and complete a freely chosen, complex,
independent inquiry?

Self-Scaffolding in Reflection: Narratives of Concrete Experience

As shown in the discussion of her final paper, Sarah used a combination of technical reflection,
practical/deliberative reflection, psychological reflection, and social/critical reflection in working toward
her goal to become a more effective and sensitive online teacher. Sarah was adept at reflection when she began the course and refined her skills through engaging with the course readings and interacting with other participants. These skills are clearly visible in the email messages and journal entries discussed in this chapter. She noted several times that she was thinking and reflecting as she was writing. The online media did not appear to pose an obstacle to her use of reflection skills and may even have enhanced her use of these skills because of the persistence of online communication (discussed below). Her reflective writing process and use of the seven key features of reflection have been discussed related to two episodes (focusing the research question, and questioning strategies presented in the Wood article) and her final paper.

Sarah relied on concrete experience to understand the abstract concepts of action research, often in the form of natural narratives from her life. Prince (2003: 67-68) defines natural narrative as “[a] narrative occurring spontaneously in ‘normal’ everyday conversation.” Numerous times she uses the word “concrete” – she is a concrete person, she would have liked more concrete examples of action research studies earlier in the course, and impartiality is easier to achieve if we have something concrete to look for such as counting the number of instances of different types of behavior. She also states numerous times that real world connections and connections to the classroom are important to her.

Sarah’s learning appeared to follow a pattern of meeting unfamiliar concepts or unfamiliar names for concepts, searching for practical examples to illuminate their meaning, and a resolution that integrated the abstract with the concrete. This was followed by her use of the new concepts or vocabulary in dialogue or research activity. In this way, Sarah used experiences to scaffold her understanding of action research. These experiences take the form of anecdotes from her life or connections to established frames of reference. In a writing about impartial observation, she connects the abstract to the concrete by recounting a story about her emotional response to her son’s cutting his new t-shirt by accident: “My emotions got in the way in this instance whereas, an impartial observer would have noted that he did indeed cut out the pictures he had wanted to cut out and he stuck with this task for over 10 minutes” (1/28/04). She also connected abstract discussions of impartiality to activities practiced in her school’s collegial coaching training.
Another example is a story that helped her understand her past behavior and the need to make a change when making research observations:

This reminds me of Mason – don’t justify, explain, rationalize. I do these things all the time! I think it will be hard for me to shush explanations because I have made them such a part of my communication in every day life – it’s almost as if I feel people won’t want to listen to what I have to say unless I can provide the relevance or justification. Maybe I can blame my mom and sister who incessantly asked me, “Well, didn’t you consider this?” as if I had overlooked some really obvious point. Now, regardless of the situation, I spend my time trying to anticipate what my audience is thinking and trying to address all possible questions/criticisms. (2/15/04)

When she was considering the importance of her supportive listener role with Corel, Sarah combined ideas gathered from a reading in a professional journal with memories of her own youth:

I was reading an article from Educational Leadership … and the article mentioned our need to interact with others—not just for intellectual reasons, but to be heard and to help us make sense of the world around us. This reminded me of when I was in high school and I worked at a local jewelry, clothing, store. The women I worked with were either in college or in their 40’s and I remember my conversations with them as being one of the high lights of working there. They were eager to listen to my stories—even if I was grumbling about school or complaining about my boyfriend or my mother. I guess this memory just gives me some perspective—how we do reach out to those in our lives for validation, for another’s perspective, for understanding. (4/8/04)

Sarah’s coding exercise, which impressed me as evidence of a competent grasp of coding when I read it as instructor, was enjoyable to her and done with ease because it was similar to using reader response theory as an English teacher. Sarah was most effective and most comfortable when she was “in action” — applying the principles of action research to the evaluation of an actual study or to the data of her own study. Both of these concrete activities validated her past activities and gave her a sense of empowerment that fostered a belief in herself as a capable action researcher.

As instructor, I also used stories to help Sarah scaffold her understanding of action research. When she asked if a claim was like a thesis statement, I confirmed and exemplified with a news story:

Yes, a claim/warrant could be a thesis statement. The thesis statement could also have a number of claims/warrants of smaller scope to support it. A thesis statement might be something like, "9/11 could have been prevented if Bush had been less fixated on 'getting' Saddam and more serious about al-Qaeda threats." This is a broad claim, but embedded in it are several other claims -- that Bush was fixated on getting Saddam, that this interfered with his judgment about the seriousness of the al-Qaeda threat, that taking the threat more seriously would have resulted in more effort, intelligence, resources, etc. to combat al-Qaeda, the these additional efforts would have thwarted the 9/11 terrorists. Each of these claims might also have sub-claims. Can get rather complicated when the issue is big. Each would need evidence and a warrant. Fixated evidence: Richard Clarke's and Paul O'Neill's statements, as well as others. Warrant: When one is fixated, one uses bad judgment? Etc. (3/22/04)
It appears that, for Sarah, the abstract is accessible primarily through the concrete, and that abilities are proven mainly through their actualization in practice.

**Affective Dimension**

One important role the affective dimension played in the course was to support learning relationships. Sarah and the instructor began the course with a relationship of trust already established from a previous course. In our final interview on June 17, Sarah noted the importance of trust: “[O]ne reason I was able to email you and talk, communicate with you the way I was is that I trusted you. I knew you as an instructor and I felt … even though I got to know you much better now, I think that I felt that trust.” We also had other things in common: a mutual interest in literature, a reflective nature, and a regular practice of journaling as teachers. The clear result of this trusting relationship was active communication between Sarah and myself. It was Sarah’s view that, without this active exchange, her learning would not have been as effective. In her final interview (6/17/04) she stated: “I think that you just kept me going … if it was more of an independent project where you folks sent me off and I was supposed to be doing something on my own … I can see how I would have had to withdraw or take whatever the bad grade was. I really need that reinforcement. I didn’t know that.”

Another role of affect was its influence on the research process. Regarding Sarah, a case can be made that affect rather than cognition was the driving force. According to Bandura (1997), positive affect empowers, builds confidence, and increases self-efficacy. Bandura and Boud et al. (1985a and 1985b) show that negative affect presents obstacles to reflection and learning and must be addressed for the processes to continue. Sarah’s self-reports are consistent with these findings.

As she was preparing her final paper at the end of the semester, Sarah took the initiative to review all the chat summaries produced to date (5/4/04). She did this in order to: (1) gain an overall understanding of action research; (2) see how her research project fit together as a whole; and (3) gain new insights. The importance of the affective dimension was one of the key themes. Emotions were an integral part of the research process: “As I was reviewing the chats and typing my thoughts I realized that my comments were all feeling comments—how I was feeling at the time and why. Curious. This reminds me of Kuhlthau’s work and I think it also shows how I am more emotional than intellectual.” She added that she felt unable
to process the information quickly, which also had emotional consequences for her learning: "I think my hesitancy to face my failures and misunderstandings just caused them to magnify. Now I know the process and I know my tendencies/weaknesses so next time I would hope that I could change my ways."

The modules that were most difficult were Module 5 on "Research Proposals," Module 7 on "Data Analysis," and Module 9 on "Claims and Warrants." Sarah felt unable to create an "intelligent" proposal at the time the proposals were due. She confirms what Kuhlthau (1993) and others have identified as one of the most difficult stages of the research process - focusing the topic: "Selecting the topic and forming the questions was difficult. I'm still not happy with my work and rather than face my failures, I just neglected them and now, as I think about writing the paper, the weak proposal seems to be a real detriment."

Data analysis was difficult and confusing for Sarah because it required her to learn a new language - the language of research. Her negative emotional reaction to this was, again, a barrier to her learning: "This section was confusing for me at the time because it required me to think about vocabulary and definitions that were out of my realm of experience. Look, I even forgot entirely about this section because it was so tricky for me at the time."

Similarly, the work on claims and warrants was very challenging: "This seems like the place where I fragmented my thoughts again ... This was one of the hardest sections for me—both in understanding the reading and creating my own claims and warrants." This is another example of how negative emotional reactions can obstruct learning:

I don't think I was ready that night to process all of this. It seems pretty simple to me now, but look, here again I feared returning to my messy claims and warrants so rather than face the challenge and struggle through them, I just went on to the next week's reading and assignments ... The claims and warrants week I returned to my survival mode. (5/4/04)

Though some readers may not agree with Sarah's assessment of her claims and warrants as "messy," what Sarah may be referring to is clarity about the topic itself rather than the actual claims and warrants she produced for the exercise. That Ruth also had difficulty understanding claims and warrants may indicate that the concepts are inherently difficult to understand, the readings were unclear, or the instructor failed to present and clarify the ideas effectively. Despite the difficulty, time had allowed Sarah to process this information; she notes that what had seemed difficult to her at the time of Module 9 on Claims and Warrants (3/17/04) now seems simple.
Sarah was apparently able to manage her negative emotions and process the large amount of new information presented in the course. In two modules – Module 10 on “Ethical Issues & Coding to Theory Building” (3/31/04) and Module 11 on “Researching Differently [Study Evaluation]” (4/7/04) – ideas and understandings started to fall into place. She began to see how she could make sense of the data through coding, which was a more familiar activity to her: “Creating categories seemed very natural to me and asking ‘what is going on here?’ seemed like something I did naturally as opposed to some of the other exercises we did.” About Module 10, she states, “the coding week I jumped in and felt good.”

Critiquing an action research study helped her integrate what she had learned throughout the semester, and she applied her analytical and evaluation skills to produce a fine critique. This was empowering for her and gave her confidence that she could successfully produce her own research report:

In looking for all the elements of what we have been working on in another researcher’s work I was able to connect some dots and actually see some parts of the writing that I thought demanded more explanation or other considerations. This was a little empowering for me. Also, from the examples provided I could see that I was capable of producing this type of writing—I can speak about what happened, how I examined it and what I think it means. If I keep that in mind, then I’m not so worried about the research paper. (5/4/04)

The process of reflecting as she reviewed the chat summaries also helped Sarah understand herself better as a learner. Her most important realization was directly tied to her emotional responses to difficult material: “My a-ha is that I avoid things I don’t understand. This makes me sad because I thought I was a person who accepted challenges, but it seems that as a learner I avoid challenges to my thinking.” She summarizes at the end of the chat review: “I see my weaknesses as a researcher/student—when I didn’t ‘get it’ I avoided the task. I instead immersed myself in the next week’s assignments.” Sarah’s demonstration of action research skills in her study evaluation and final paper show that this was not a serious obstacle to her learning overall. Her final comment in the chat review was positive and reassuring: “the 699 has validated things that I do as a teacher—reflection, seeking the input from others, taking time to improve my practice, considering how I might share my experiences with others to help them in their teaching.”

**Co-Reflection and Co-Construction of Knowledge**

To reiterate, co-reflection consists of the “intellectual and affective activities in which two or more individuals collaboratively engage to explore their experiences in order to lead to new intersubjective
understandings and appreciations. Co-reflection is part of the process of co-constructing knowledge through interactions. Co-reflection uses some or all of the seven key features of reflection.

Evidence of a very active kind of co-reflection leading to the co-construction of knowledge by Sarah and the instructor has been presented primarily in the narratives of the three episodes related to focusing the research question, the questioning strategies presented in the Wood article, and clarifying Sarah's role as a telementor. These episodes were selected because of their importance to the development of Sarah's research project. This section will use evidence from these episodes, supported by other data, to identify the characteristics of co-reflection for Sarah's case and the knowledge that was co-constructed by Sarah and the instructor through this process.

The common experiences Sarah and I as researcher shared through the telementoring project during the fall of 2003 were the contextual basis for the structuring and content of the course, as well as an important foundation for many of our course discussions. In addition, the similarities in our teaching philosophies, experience with reflective practice and journaling, and interest in literature and writing imply commonly held assumptions and tacit knowledge about teaching, learning, writing, and doing research. This is not to say that there were not important differences in our views. Teachers bring to the learning process diversity in experiences and personality that provide alternative ways of thinking and create fertile ground for reframing perspectives. It seems that co-reflection is aided by a balance of similarities and differences in the viewpoints held by the co-reflectors. Sarah indicated this in her chat review (5/4/04): "I think the dialogue with Joyce proved this to be the most true for me. It's curious, even though Ruth and I are both teachers, mothers, librarians ... I think we see things so differently."

Though I may not have explicitly stated this to Sarah, I was keenly interested in how she would examine and analyze her building of a virtual relationship with Corel. I had observed how the relationship had unfolded during the fall of 2003. As noted in Chapter 3, my original research focus was on the affective and interactional dimensions of learning through dialogic inquiry. I had worked to amass the theoretical background for doing such a study and was familiar with the information seeking process, particularly the Kuhlthau model. Sarah mentioned that she was not conversant with the Kuhlthau model, although it was
not unknown to her. She had not yet practiced librarianship, so the model was an abstraction unrelated to concrete experiences.

What Sarah possessed that I did not was an abundance of experience and knowledge as a teacher of students like Corel. Because I lacked this, I was impressed by how skillfully she had transferred her skills to the online environment in the early correspondence. Perhaps because these skills were so natural that she hardly noticed them, she was unaware that a relationship was developing until I mentioned this to her in a telephone interview on November 12, 2003.

The article by David Wood that Sarah found so meaningful for her work was originally collected for my dissertation research. It was one of a number of articles gathered for the same purpose that I provided her with. She selected that particular article because it resonated with the direction she was moving in her research. I did not direct her thinking; she freely chose her research questions and followed them through to the final report. It may well be the case, however, that had I not been her learning facilitator, her project would have taken a different turn. This is not to say it would not have been better without my background contributions and support, but simply different.

Although not overtly or purposefully so, Sarah’s research project was collaborative. Her final paper was in a sense a co-construction of knowledge by us. In my general comments on her final paper, I stated:

You basically tackled my [original] dissertation topic and did a far better job than I would have. I aimed to look at the affective and interactional elements of telementoring which, when put together, is relationship building ... Because of your ten years’ experience teaching students like Corel, you have a wealth of experience to draw from. You made connections, asked questions, and provided insights that I probably wouldn’t have even thought of. I could have elicited this kind of information from you through interviewing, but the process would have been intensive, extensive, and time consuming. I would have learned a lot (which is a good thing), but it’s both more efficient and more convincing to the reader that you have written this in your own words. For me to do anything equivalent, I think I would need to have similar classroom experience. This is an excellent argument in favor of action research. It is also an excellent argument for researching a topic rooted in one’s own experiences.

(6/14/04)

The features of Sarah-instructor co-reflection related to Sarah’s research project are summarized in Chart 32.
Chart 32. Features of Sarah-Instructor Active Co-Reflection

<table>
<thead>
<tr>
<th>Sarah’s Contributions: Knowledge of Facilitating Learning for High School Students</th>
<th>Instructor’s Contributions: Knowledge of Action Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understood Corel from teaching experience</td>
<td>Introduced concepts and methods needed for analysis</td>
</tr>
<tr>
<td>Adapted F2F teaching skills to telementoring</td>
<td>Mentored use of AR and provided emotional support</td>
</tr>
<tr>
<td>Analyzed data with deep questions and insights</td>
<td>Provided readings and exercises for Sarah’s needs</td>
</tr>
<tr>
<td>Saw a role change from librarian to supportive listener</td>
<td>Noticed a telementoring relationship developing</td>
</tr>
<tr>
<td>Provided revealing insights on her roles and nature of online communication</td>
<td>Gave background on the senior project and the telementoring</td>
</tr>
</tbody>
</table>

At numerous points in Sarah’s end-of-semester chat review (5/4/04), she notes occasions when interaction with the other course participants had helped her reframe her ideas: (1) “What I most enjoyed during the 699 was sharing my reflections with Joyce through emails, journals, and the dialogue and with Ruth and Joyce via the chats. I realized that even though I thought I was being open minded or considering something from various vantage points, there was still more interpretation that could be made.” (2) “I think that Joyce’s comments to me in the wiki, chat, journals helped me to see how to better formulate my thinking.” (3) “Joyce pointed out that the teacher standards as outlined by the Hawaii Teachers Standards Board are vague and immeasurable. So, how could I use those as the guidelines for my research? Here, her outside vantage point led me to realize that what I had accepted as ‘good’ benchmarks of teaching needed to be re-examined and defined more specifically for the purposes of this project.”

Together, these comments constitute an outline of some of the means and benefits of co-reflection – alternative interpretations, reformulation of one’s thinking, and reexamination of assumptions. Sarah makes a clear connection *and distinction* between reflection and co-reflection. *Sharing her reflections* helped her to see things from different vantage points, consider alternative interpretations, and attain a better, less limited, less judgmental perspective. I believe this is the essence of co-reflection. I benefited in the same ways from co-reflection with Sarah.
There is a necessary synergy between relationship building and co-reflection, and that synergy is fueled by respect, trust, and concern. The earlier discussion of the first episode on focusing the research question provides a detailed analysis of how respect, trust, and concern are revealed in the discourse of the exchanges between Sarah and myself. How Sarah communicated these to her telementee is discussed in her final paper. As Sarah’s final course comments clearly indicate, interactions based on respect, trust, and concern were vital for her learning and successful completion of the course. From comments made during the final interview, it is clear that co-reflection and relationship building were synergistic for Sarah and may have been enhanced by the online media:

Email with you [instructor] was so good because you just kept me energized, and encouraged me, and you gave me things to think about, and I really appreciated how quick the turnaround was. You were there. I thought that must have been so time consuming for you to address all my emails, but I really valued that. And I think that you just kept me going. I think that if I had … if it was more of an independent project where you folks sent me off and I was supposed to be doing something on my own, I just never … I can see how I would have had to withdraw or take a whatever the bad grade was. I really need that reinforcement. I didn’t know that. So that was really helpful. Helpful too in the times when you pointed out little things about things I had missed with Corel … I was probably more willing to ask you things via the email or confess things than if we had been face to face … At one point you told me that I kind of turned the emails into journals, I think that as I was typing there I was thinking and things were happening. (6/17/04)

Because co-reflection is a collaborative process, the teacher who sees herself as a co-learner who guides the co-construction of knowledge is likely to be better able to value co-reflection and pursue her own inquiry learning within the teacher-student relationship. The role I took as instructor evolved increasingly over time from learning facilitator to mentor and co-learner. Evidence has been presented throughout this chapter that I viewed myself as a co-learner. From observing Sarah’s communication with Corel, I learned how telementors effectively communicate with high school students by being open, accepting, empathetic, humorous, and accessible. My understanding was deepened by Sarah’s statement, in her final paper, of her rationale and the descriptions of successful classroom strategies that she transferred from the face-to-face environment to the online setting. Sarah and I also had a lengthy discussion of constructivist learning (not discussed in this paper), in which Sarah taught me much through her expertise from her years of reflective practice, her school’s professional development program, and her active involvement in the local community of educators.
In her philosophy as a teacher and in the communication with her telementee, Sarah describes and demonstrates the importance of being a co-learner with her students. It is very likely that my co-learning as instructor was facilitated and supported by her belief in the value of teachers as co-learners and her regular practice of this in her classroom. This illustrates the subtle but important ways that shared social practices support learning and the attainment of intersubjective understanding.

**Role of Online Media in Communication and Learning**

The use of online media was important to Sarah, as it would have been difficult for her to attend face-to-face meetings with three young children. As a skilled practitioner of reflection, she used the journal and email writing opportunities to reflect while writing, making writing an integral part of her reflection process. She also used the online media effectively for relationship building, transferring her face-to-face communication skills to the online media. She enjoyed using the wiki and creatively used it as a data analysis tool for initial coding of her email messages to Corel. The online media were also an important co-reflection tool for Sarah.

The persistence of online communication was advantageous for Sarah, as it supported reflection and shared meaning making in a way that evanescent face-to-face interaction in the classroom does not. Summarizing is a reflective process of abstraction and synthesis that can contribute to further reflection, clarification, and new perspectives over time. In her chat review, Sarah described how this could occur:

> When I went into the chat that night [for the module on claims and warrants] I was a little lost. During the chat, my confusion cleared and I started to feel I had a handle on my ideas. Later, when Joyce listed out [in the chat summary] my claims, evidence and possible warrants, I almost did a double take—she had made everything seem so clear and at the same time, I don’t think my notes from the chat were this clearly set out. I’m so thankful that the wiki enables us to return again and again because if she had just said these things to me, they would now be lost. This is one situation where the medium really assists muddled thinkers like me. I don’t think I was ready that night to process all of this. (5/4/04)

Because the chat summaries were available, Sarah used them to clarify and solidify her thinking, integrate what she had learned, reflect on previous discussions to gain new insights, and share these reflections with her instructor. The process of reflecting on the chat summaries allowed her to see the research process more clearly, identify weak areas, revisit the information process, and identify her
weaknesses as a researcher and a student. It is readily conceivable that without the availability of the summaries, these achievements would have been more difficult and time-consuming.

**EPILOGUE**

The action research course and the telementoring project provided Sarah with ambitious challenges that she met admirably, even without considering that she was also working full time during the first half of the semester, taking another graduate course, and managing a family with three small children. She availed of all of the course resources in a manner that was timely for her learning, and she used the online tools to best advantage, particularly for reflection and co-reflection. Her learning was transformative in all ways — elaborating existing frames of reference, learning new frames of reference, transforming points of view, and transforming habits of mind about herself.

Relationship building in the online environment was the central issue of Sarah's inquiry and the foundation upon which she built her strong contributions to collaborative learning in the course. The affective dimension was critically important to both her research process and relationship building. In a manner true to constructivist principles, Sarah's progress is reflected in the changing roles of the instructor — from learning facilitator to action research mentor to co-learner of teaching and reflective practice. Due to Sarah's visibility in the online communication, the story of thinking and learning as a dialogic process in which affect, cognition, and interaction are inseparably united is in large measure the story of the collaborative learning relationship between Sarah and her instructor.
CHAPTER 7. FINDINGS AND DISCUSSION

INTRODUCTION

The aims of the present study are to examine the co-construction of knowledge and how affect and interaction influence participant understanding of action research. The research questions were: (1) What are the key cognitive, affective, and interactional elements of the online conversations? (2) How do student-instructor interactions influence student understanding in the action research course? (3) How do student-instructor interactions influence course development? Through narratives and narrative analyses, Chapters 5 and 6 addressed these questions as they relate to the individual student cases.

As discussed in Chapter 3, the researcher's original intent was to identify through grounded theory coding the key cognitive elements in the students' thought processes related to action research and to determine the influence of key affective and interactional elements on these cognitive elements as the students' understanding of action research changed. Scrutiny of the data led to the realization that the two cases of student learning were substantially different from each other. This in turn led to the use of narrative analysis as the most effective means of illuminating the complexly different cognitive, affective, and interactional aspects in each student case. This changed the focus of the research from identifying discrete elements correlated with each other to a focus on the narrative as the unit of analysis in a holistic learning process. In the light of this changed focus, the research questions are revised as: (1) What are the key narratives of learning, and how do these narratives exhibit cognitive, affective, and interactional aspects? (2) How do student-instructor interactions influence student understanding in the action research course? (3) How do student-instructor interactions influence instructor understanding about how to effectively facilitate the learning of action research?

This chapter discusses the major findings that address the revised research questions. First, the three key narratives of learning as a holistic process involving cognition, affect, and interaction are: (a) the primary narrative of student learning in the action research course; (b) the reflection sub-narrative; and (c) the co-reflection sub-narrative. Second, co-reflection, an intersubjective, social process, is central to the co-construction of knowledge and involves: (a) sharing of experience and relevant information; (b) achievement of intersubjective understanding through collaborative meaning making and knowledge co-
construction; (c) synergy between co-reflection and relationship building based on respect, trust, sincerity, and concern; and (d) instructor as co-learner. Third, *facilitation of the learning of action research* is effectively supported by: (a) course design incorporating field-based, inquiry learning; (b) instructor understanding of learner backgrounds, frames of reference, learning styles, and types of reflection and co-reflection; (c) learning philosophy that values constructivist learning, affect and relationship building in learning, the development of self-efficacy, and empowerment; (d) a combination of online and face-to-face facilitation and mentoring skills; and (e) simple, flexible software programs that allow co-learners to freely and easily create their own web pages and adapt to different communication and learning styles. Based on the findings, the dialogic inquiry framework (see Chapter 2, Figure 2) that was used as the basis for the course design was revised as a narrative learning framework. The major findings are summarized in Chart 33.

**Chart 33. Major Findings of the Study**

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Findings</th>
</tr>
</thead>
</table>
| **What are the key narratives of learning, and how do these narratives exhibit cognitive, affective, and interactional aspects?** | The three key narratives of learning as a holistic process involving cognition, affect, and interaction are:  
(a) *Primary narrative* of student learning in the course;  
(b) *Reflection sub-narrative*;  
(c) *Co-reflection sub-narrative*. |
| **How do student-instructor interactions influence student understanding in the action research course?** | *Co-reflection*, an intersubjective, social process, is central to the co-construction of knowledge and involves:  
(a) Sharing of experience and relevant information;  
(b) Achievement of intersubjective understanding through collaborative meaning making & knowledge co-construction;  
(c) Synergy between co-reflection and relationship building based on respect, trust, sincerity, and concern;  
(d) Instructor as co-learner. |
| **How do student-instructor interactions influence instructor understanding about how to effectively facilitate the learning of action research?** | *Facilitation of learning action research* is effectively supported by:  
(a) Course design incorporating field-based, inquiry learning;  
(b) Instructor understanding of learner backgrounds, frames of reference, learning styles, and types of reflection and co-reflection;  
(c) Learning philosophy that values constructivist learning, affect and relationship building in learning, the development of self-efficacy, and empowerment;  
(d) Combination of online and face-to-face facilitation and mentoring skills;  
(e) Simple, flexible software programs that allow co-learners to freely and easily create their own web pages and adapt to different communication and learning styles. |
This chapter accomplishes two purposes. First, it presents a narrative learning framework that incorporates revisions to the Dialogic Inquiry Framework (see Chapter 2, Figure 2) that was used as the basis for the course design. Second, it addresses the three research questions using this framework to organize the subsequent discussions of the study’s findings. The framework consists of three major components: co-learner resources, the learning process, and learning outcomes. The discussions in each chapter section (corresponding to components of the narrative learning framework) address different aspects of the three research questions. They elaborate on the cognitive, affective, and interactional aspects that address the first research question. The various sections also discuss the cognitive, affective, and relationship-building aspects of the student-instructor interactions that address the second and third research questions through summarizing and contrasting the findings from the primary narratives and significant learning sub-narratives for each student case. Key findings related to the instructor’s improved understanding of how to effectively facilitate the learning of action research are also discussed. Due to the complex, multidimensional, and holistic nature of learning, the findings that address the research questions are found in different and multiple sections of this chapter, as shown in the Chart 34.
### Chart 34. How Chapter 7 Addresses the Study's Research Questions

<table>
<thead>
<tr>
<th>Chapter Section</th>
<th>Research Question 1: What are the key narratives of learning, and how do these narratives exhibit cognitive, affective, and interactional aspects?</th>
<th>Research Question 2: How do student-instructor interactions influence student understanding in the action research (AR) course?</th>
<th>Research Question 3: How do student-instructor interactions influence instructor understanding about how to effectively facilitate the learning of action research (AR)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO-LEARNER RESOURCES*</td>
<td>Background (frames of reference, learning styles, motivation, self-efficacy, &amp; relationships among co-learners) affects the learning process.</td>
<td>Instructor’s philosophy, course design, facilitation, &amp; mentoring skills influence the nature of student-instructor interactions.</td>
<td>Student backgrounds influence instructor’s facilitation &amp; mentoring strategies.</td>
</tr>
<tr>
<td>Key learning narratives exhibit cognitive, affective, &amp; interactional aspects.</td>
<td>Reflection is a critical thinking process with cognitive, affective, &amp; narrative aspects.</td>
<td>Co-reflection is a critical thinking process with affective, interactional, &amp; relationship building aspects.</td>
<td>Co-reflection has affective, interactional, &amp; relationship building aspects for gaining AR understanding. Co-reflection type influences degree of interaction &amp; relationship building.</td>
</tr>
<tr>
<td>Typology of Reflection, Co-Reflection, and Research Approaches</td>
<td>Type of reflection may indicate or influence type of co-reflection &amp; preference for research approach.</td>
<td>Type of reflection may indicate or influence type of co-reflection, degree of interaction, &amp; preference for research approach.</td>
<td>Reflection &amp; co-reflection types &amp; preferred research approach influence instructor’s facilitation &amp; mentoring strategies.</td>
</tr>
<tr>
<td>Dyadic and Small Group Co-Reflection</td>
<td>Group co-construction of knowledge may differ by size of group.</td>
<td></td>
<td>Group size may affect facilitation &amp; mentoring strategies.</td>
</tr>
<tr>
<td>Online Activities: The Value of Simple, Flexible Software</td>
<td>Simple, flexible software supports creation, use, &amp; improvement of artifacts of the knowledge construction process.</td>
<td>Simple, flexible software supports creation, use, &amp; improvement of artifacts of the knowledge construction process.</td>
<td>Simple, flexible software supports instructor’s ability to adapt to different communication &amp; learning styles.</td>
</tr>
<tr>
<td>LEARNING OUTCOMES*</td>
<td>Improved student understanding &amp; higher self-efficacy in AR.</td>
<td>Improved student understanding &amp; higher self-efficacy in AR.</td>
<td>Improved instructor understanding &amp; AR facilitation skills.</td>
</tr>
</tbody>
</table>

*Section titles in capital letters indicate the three major components of the Dialogic Inquiry and Co-Reflection Framework.*
NARRATIVE: INTEGRATED FORM FOR CONCEPTUALIZING LEARNING

Viewing the learning process as a narrative provides a unified view of how learning is forged from affective, cognitive, interactional, and transformational dimensions. The process of learning can be identified through a plot whose complicating action is a consequential event that leads to change—a learning transformation. A basic textbook definition of learning (Schunk, 2004: 484) is "an enduring change in behavior or in the capacity to behave in a given fashion resulting from practice or other forms of experience." A more complex view is offered by transformative learning theory (Mezirow, 2000: 5): "[learning is] the process by which we transform our taken-for-granted frames of reference ... to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action." A story can be a tool for thinking that allows students to express thoughts, feelings, and judgments regarding causes and resulting actions or effects. Two major benefits of conceptualizing learning as narrative are an appreciation for the complexity of learning and a greater emphasis on how students use their frames of reference to make meaning. This respects individual backgrounds and learning differences and serves as a counterbalance to the predominantly behaviorist orientation of many classrooms and educational textbooks (e.g., Schunk above). Narratives are used to share ideas and experiences, create collaborative meaning, co-construct knowledge, and sustain intersubjective understanding.

In the dialogic inquiry framework that was the basis for the course design (see Chapter 2, Figure 2), the cognitive, affective, interactional, and transformational dimensions were originally presented as separate characteristics of the learning process, although it was realized that in practice they are interrelated and mutually reinforcing. The analyses in Chapters 5 and 6 demonstrated that each dimension is a different lens for viewing a unitary, dynamic phenomenon. In those chapters, the section, "Learning Action Research," describes the students' acquisition of basic concepts, but the research case analyses show that these concepts were often not learned without the motivating trigger of affect. Ruth's metaphors were often a response to a feeling about an idea that could not yet be clearly articulated. Using metaphors infused with affect helped her self-scaffold her learning of the core concepts. Sarah's comment prefacing her end-of-
semester chat review confirmed the importance of affect that was evident in the personal stories she used to self-scaffold her learning: “As I was reviewing the chats and typing my thoughts I realized that my comments were all feeling comments – how I was feeling at the time and why.”

The interactional dimension was a critical factor for learning and inseparable from the affective dimension in student-instructor relationship building. In Chapters 5 and 6, the sections, “Planning and Conducting Research” and “Co-Reflection and Co-Construction of Knowledge,” clearly showed the importance of student-instructor interactions in focusing the research topic, deepening and expanding understanding, sustaining research efforts, and overcoming obstacles. The case was made that the students’ final papers were in part a co-construction of knowledge between student and instructor. Ruth’s topic refocus was the result of student-instructor co-reflection, and her use of the garden metaphor to shape her final paper was arguably the result of tacit co-reflection. Sarah’s comprehension of her role as supportive listener to Corel was initiated by student-instructor interaction, and the continual refinement of her research questions was steered by insights gained through student-instructor co-reflection. The value of co-reflection and how the learning relationships sustained such co-reflection were confirmed by student comments in the section, “Final Course Comments.”

With its focus on action and agency, narrative analysis presents learning as a process with multiple dimensions. At different levels of time, space, specificity, and numbers of participants, the narrative presents a clear and memorable form whose status as a meaning-making tool has been validated across time, across disciplines, and through the events of our daily lives.

In the light of the findings of the analyses of two student cases, three revisions to the Dialogic Inquiry Framework have been made. First, the framework has been renamed with the addition of the term co-reflection: Dialogic Inquiry & Co-Reflection Framework (DIACOR). This change better reveals the complexity of dialogic inquiry among adult learners Ancillary to this, co-reflection has been added to the enumeration of online activities. Second, the process of learning is viewed as a narrative consisting of affective, cognitive, interactional, and transformational dimensions. Third, the learning facilitator views himself/herself as a co-learner with the students. The awareness of this aspect of the learning process leads not only to an understanding of how knowledge is co-constructed with students but also to the recognition
and valuing of the learning facilitator’s attainment of higher self-efficacy, transformational experience, and transformed understanding. This is an important point, as Lund (2004: 167) notes that despite the theoretical grounding of CSCL in the co-construction of knowledge, “human support is most widely represented in the literature in a quite limited sense. First, it is portrayed most often from the tutor’s point of view and not as an inherent part of a co-constructed interaction. Secondly, human support is generally seen as being given by tutors to tutees, and is not portrayed as often in other CSCL participant combinations (e.g., support given by students to students).”

Figure 13 presents the revised DIACOR Framework. The framework will be used throughout the remainder of this chapter to organize the discussions of the study’s findings.

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30 Some notable exceptions to this are the focus on student-student interaction in the work of Marlene Scardamalia and Carl Bereiter (1999) on CSILE (Computer Supported Intentional Learning Environments) and Jeremy Roschelle (1992).
CO-LEARNER RESOURCES

This section discusses the co-learner resources component of the DIACOR Framework, as highlighted in Figure 14.

Figure 14. DIACOR Framework: Focus on Co-Learner Resources

“Co-Learner Resources” in the framework represent the traits, knowledge, experience, understanding, and motivation participants bring to the learning process. Co-learners (instructors and students) make different contributions to the overall learning narrative. In most instructional settings, the instructor provides the structure, rhythm, and basis for community, using his/her frames of reference to design and conduct the learning activities. He/she uses affect appropriately to facilitate learning and to build a safe learning environment and trusting relationships with the students. This encourages the development of new ideas, co-reflection, and the co-construction of knowledge. Because co-reflection is a process of collaborative meaning making, it is clear that the frames of reference all learners (instructors included) bring to the process are the essential building blocks for the creation of meaning. Frames of reference are best apprehended as they appear in participant self-reports.

In this study, the professional culture that the participants shared as experienced teachers and trained librarians provided a common set of values and concepts related to inquiry learning, learner agency and self-empowerment, information literacy skills, social responsibility, and teaching skills in the service of students as lifelong learners. The shared professional culture was important for establishing common ground, context, and trust (Clark and Brennan, 1992; Olson and Olson, 2000). Perhaps because all three participants were female, differences of view were recognized, valued, and negotiated rather than argued or
debated to a resolution. That this was an all female group may have also supported the expression of empathy and emotions in the communication.31

Despite the common values and assumptions, there were marked differences in learning style. Although all three participants were slightly to moderately reflective according to the Solomon-Felder Index of Learning Styles, Ruth was strongly visual and sequential, Sarah was slightly verbal and moderately global, and the instructor was strongly verbal and strongly global.

Among the participants, only the instructor had previous experience doing research (although not action research), as well as reflective practice and journaling. Sarah was experienced at reflective practice and had participated as a teacher in her high school's professional development program, as well as doing peer cognitive coaching. Sarah did journaling as part of her reflective practice. Ruth had not participated in a professional development program, although she had met informally with peers in developing grade-level teaching strategies. Ruth did not do journaling as a regular practice.

Only Ruth had previous experience with a completely online course that had left her with misgivings about online communication. Sarah had used online learning tools as a support in face-to-face classes. Both were new to the wiki-style website. The instructor had no experience teaching or taking a completely online course but had used the wiki software to support learning in face-to-face LIS classes.

The participants differed significantly in mentoring experience. Sarah was probably the most experienced. She had mentored or coached peers and students of varying ages, and had been mentored as a student teacher. This was her first experience with telementoring, however, and she communicated with her high school mentee completely online. Her telementee, like Sarah, was adept at communicating through writing. Ruth had been mentored as a student teacher and beginning librarian but had not been a mentor herself. Ruth chose to use primarily face-to-face communication with her high school mentee because it was more comfortable, efficient, and effective, and opportunities were readily available while she worked part-time at the high school library. In addition, her mentee had difficulties with grammar and writing. The instructor had been mentored as a beginning teacher and new librarian and had also trained and mentored a paraprofessional librarian while working as the head of a small, special library in the Philippines.

31 See Chapter 3, footnote 15.
As course designer, the instructor brought structure, materials, activities, learning objectives, and explicit and implicit values, assumptions, and goals. Chapter 4 discusses these in detail. Though implicit values are challenging to self-determine, the main points are summarized below.

**Instructor/Researcher Beliefs and Assumptions**

- Learning is a whole-person activity.
- Empowerment is an important goal of learning.
- Learning requires the co-construction of knowledge, which is aided when the artifacts that result from the process remain available for reflection.
- For novice users of collaborative software, social resources for interaction and collaboration are more vital than software functionality for supporting online learning.
- Relationship building based on respect, trust, and sincerity is as fundamental to online learning as it is to learning in face-to-face environments.
- Students who create their own web pages as part of the learning process are more likely to reflect and to sustain their motivation for learning in the virtual environment.
- Easy-to-use, flexible online software allow users to innovate to best meet their learning needs, encouraging participants to adapt “offline” strategies to the online environment that may demonstrate new uses to guide the design of educational software.
- Qualitative research methods are better suited to action research than quantitative ones.

**Instructor Goals**

- Provide an environment conducive for self-awareness, questioning, and critical thinking skills.
- Provide a range of conceptual and practical action research tools appropriate for novice teacher researchers.
- Provide an opportunity for knowledge to be co-created.
- Facilitate online communication to maximize its advantages and compensate for difficulties such as minimal nonverbal cues, physical dispersion, or isolation.
- Provide participants with the opportunity to become familiar with new software that could be useful for their work as teachers and librarians.

**Instructor Functions and Tasks**

- Set the intended learning outcomes — concepts, understanding, skills, and products.
- Provide a framework and activities for the learning process.
- Monitor the learning process.
- Provide for means of assessing whether the learning outcomes were achieved.
- Assist learners in achieving their own goals within the learning framework.
- Assist learners in acquiring the awareness, concepts, methods, and strategies relevant to action research.
- Assist learners in planning, conducting, and monitoring their progress in an action research project using such strategies and awareness.
- Assist learners in identifying problems, setting workable goals, and selecting and implementing strategies for action.
- Motivate learners and help them harness their personal strengths.
- Provide guidance, encouragement, and collaborative support through communication that is characterized by acceptance, empathy, and genuineness.

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These have been adapted in part from Tomlinson (1995).
Chart 35 presents a summary of the resources the co-learners brought to the learning process.

**Chart 35. Summary of Co-Learner Resources**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Ruth</th>
<th>Sarah</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching Experience</strong></td>
<td>Elementary teacher</td>
<td>High school English teacher</td>
<td>Beliefs, assumptions, goals, tasks, &amp; functions as a graduate level instructor</td>
</tr>
<tr>
<td><strong>Reflective Practice &amp; Professional Development Experience</strong></td>
<td>No professional development professional development experience</td>
<td>Extensive reflective practice &amp; professional development experience</td>
<td>Moderate reflective practice &amp; professional development experience</td>
</tr>
<tr>
<td><strong>Research Experience</strong></td>
<td>No research experience</td>
<td>No research experience</td>
<td>Moderate research experience; no experience with action research</td>
</tr>
<tr>
<td><strong>Mentoring Experience</strong></td>
<td>Little mentoring experience</td>
<td>Extensive mentoring experience</td>
<td>Moderate mentoring experience</td>
</tr>
<tr>
<td><strong>Prior Relationship with Co-Learners</strong></td>
<td>No prior relationship with instructor</td>
<td>Prior relationship with instructor</td>
<td>Prior relationship with Sarah only</td>
</tr>
<tr>
<td><strong>Online Course Experience</strong></td>
<td>Unsatisfactory previous online course</td>
<td>No online course experience</td>
<td>No online course experience</td>
</tr>
<tr>
<td><strong>Learning Style</strong></td>
<td>Visual, sequential</td>
<td>Verbal, global</td>
<td>Verbal, global</td>
</tr>
</tbody>
</table>

**THE LEARNING PROCESS**

**Key Narratives of Learning as a Holistic Process**

This section begins the discussion of findings related to the learning process, with summaries of the primary narratives, reflection sub-narratives, and co-reflection sub-narratives for the student cases. It addresses the narrative forms used in the DIACOR Framework, as highlighted in Figure 15.

**Figure 15. DIACOR Framework: Focus on Learning Narratives**

- **CO-LEARNER RESOURCES** *(includes instructor)*
  - Self-Efficacy *(Affective, Cognitive) Experience, Knowledge, Understanding, Motivation*

- **DIALOGIC INQUIRY & CO-REFLECTION**
  1. Learning Processes: A Narrative that is Cognitive, Affective, Interactional, and Transformational.
  3. Activities: use information to co-construct knowledge and construct, use, and improve representational artifacts.

- **LEARNING OUTCOMES** *(includes instructor)*
  - Higher Self-Efficacy, Transformational Experience, Transformed Understanding
This section also addresses the first research question: (1) What are the key narratives of learning, and how do these narratives exhibit cognitive, affective, and interactional aspects? Narrative analysis has the advantage of being a theoretically coherent, logical means of studying learning that is matched to the nature of learning itself. Learning is a complex, multidimensional, social process shaped by individual uniqueness and social context. Narrative analysis does not shun complexity and uniqueness but rather embraces them. The art of narrative analysis in producing works of significance and utility is reduction appropriate for particular audiences using story grammars. This study uses narrative analysis to understand, explicate, and evaluate individually and socially constructed knowledge in conjunction with a narrative learning framework.

The three key narratives of learning as a holistic process are: (a) the primary narrative of student learning in the action research course, (b) the reflection sub-narrative, and (c) the co-reflection sub-narrative. The primary learning narrative was derived from the goal of the course: to learn about action research. The story grammar for the primary narrative consists of prologue, background, beginning, complicating action, result, evaluation, and epilogue.

Within each primary learning narrative, numerous reflection and co-reflection sub-narratives were identified and described through a close reading and analysis of the data, as described in Chapter 3. The most significant student learning sub-narrative (an elaboration of the complicating action of the primary narrative, i.e., planning and conducting research) was identified from student self-reports about significant consequential events and changes in frames of reference. The plot structure of this reflection sub-narrative, consisting of the seven key features of reflection, was used to show how each student's resolution of a personally challenging issue led to significant learning outcomes. The complicating action of the reflection sub-narrative is making a leap of thinking. Through identifying the complicating action of the primary narrative and most significant individual learning sub-narrative, key student learning outcomes were identified, as shown in Figure 16 (replicated from the same figure in Chapter 3).
A third type of narrative – a co-reflection sub-narrative – was also identified. The co-reflection sub-narrative is based on the seven key elements of reflection but also exhibits four interactional characteristics: (1) sharing of experience and relevant information; (2) achievement of intersubjective understanding through collaborative meaning making; (3) synergy between relationship building and co-reflection based on respect, trust, sincerity, and concern; and (4) teacher as co-learner (see Figure 17, replicated from the same figure in Chapter 3).

The reflection sub-narratives and the co-reflection sub-narratives together constitute the study of both individual and dyadic group learning during the course. These important sub-narratives also indicate the complexity of the interactions between individual and group processes in such learning, a point also noted by De Laat and Lally (2004). Chapters 5 and 6 have shown that key individual learning outcomes can be identified through the use of primary narratives and significant learning sub-narratives. The selection of
plot elements and the interpretation of discourse in these narratives relied on the researcher's judgment but were confirmed as fair and accurate by the students.

How do these narratives exhibit cognitive, affective, and interactional aspects? Each of the sub-narratives exhibits these three aspects, and all sub-narratives are subsumed by the primary narrative. This is further discussed in the next sections of this chapter. Narrative analysis enables researchers as well as instructors to analyze small changes in narrative situation at the level of event, as well as larger changes in frames of reference at the levels of a sub-narrative or primary narrative for an entire course. The benefit of narrative analysis is that, at each level, learning is seen as a plot—a unitary, multidimensional, dynamic phenomenon focused on changes in states of understanding. Affective, cognitive, interactional, and transformational dimensions are viewed as integrated and inseparable in the learning process.

To reiterate, the primary learning narratives for both students tell the story of how each learned about action research and attained the course learning objectives. The reflection sub-narratives tell the story of different transformations in frames of reference achieved by the students as they completed their individual research projects. These reflection sub-narratives focus on unique individual learning outcomes within the course framework. The co-reflection sub-narratives indicate how knowledge was co-constructed by co-learners and the impact of the co-construction of knowledge on individual learning outcomes. The narratives and their learning outcomes are summarized in Chart 36.

**Chart 36. Narratives and Their Learning Outcomes**

<table>
<thead>
<tr>
<th>Narrative</th>
<th>Learning Outcome Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Learning Narrative</td>
<td>Attainment of course objectives</td>
</tr>
<tr>
<td>Reflection Sub-Narrative</td>
<td>Attainment of individual transformations in frames of reference within the course framework</td>
</tr>
<tr>
<td>Co-Reflection Sub-Narrative</td>
<td>Co-learner co-construction of knowledge</td>
</tr>
</tbody>
</table>

As examined extensively in Chapter 5, Ruth's primary narrative focused on self-discovery and the use of reflection. Chart 37 summarizes the main points of Ruth's primary narrative. The complicating action, "Planning and Conducting Research," is highlighted in the chart.

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Chapter 5 also examined Ruth’s most significant learning sub-narrative about the complicating action in her primary narrative – her process of self-discovery about the influence of her learning style on her teaching and learning. This is discussed more fully below in section, “Reflection: An Individual Critical Thinking Process.” Ruth’s other important learning transformations include: (1) elaborating her existing view of research by realizing that research is a never-ending, complex, and constantly evolving process; (2) learning new frames of reference, with the awakening to a deeply self-aware use of reflection that is, in her words, “the heart and soul of real learning”; (3) changing her point of view about online learning from negative to positive; and (4) changing her view of herself to someone capable of meeting challenges and turning them into opportunities to make things better for herself and others. In the Ruth-instructor dyad, the foci of the co-construction of meaning and knowledge were: (1) the nature of action research and (2) the influence of learning style differences on teaching and learning. This is discussed more fully below in the section, “Co-Reflection: An Intersubjective, Social Critical Thinking Process.”

As examined in Chapter 6, Sarah’s primary narrative focused on relationship building, as summarized in Chart 38. The complicating action, “Planning and Conducting Research,” is highlighted in the chart.
<table>
<thead>
<tr>
<th>Case Report</th>
<th>Sarah’s Primary Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prologue</td>
<td>Themes: affect, dialogue, and relationship building in learning</td>
</tr>
<tr>
<td>Background</td>
<td>High school English teacher; reflective practice &amp; professional development experience; no research experience; much mentoring experience; no previous online course; knew instructor</td>
</tr>
<tr>
<td>Learning Action Research</td>
<td>Mastery of concepts and coding methods through drawing on her experiences with reflective practice, professional development, and teaching English</td>
</tr>
<tr>
<td>Planning &amp; Conducting Research</td>
<td>Research focused on how her method of communication, means of noticing/observation, definition of effective teacher changed due to the virtual format (focus on questioning strategies)</td>
</tr>
<tr>
<td>Final Paper</td>
<td>“Building a Relationship in a Virtual Setting” - analysis and interpretation of data to identify and value her most important, newly learned role of online supportive listener</td>
</tr>
<tr>
<td>Final Course Comments</td>
<td>“I learned that I can build a relationship with a student in a virtual format. I see teacher research as an important part of teaching and feel capable of doing teacher research.”</td>
</tr>
<tr>
<td>Epilogue</td>
<td>Narrative and sub-narrative completion</td>
</tr>
</tbody>
</table>

Chapter 6 also discusses Sarah’s most significant learning sub-narrative about the complicating action in her primary narrative – the building of a virtual relationship with her telementee. This is discussed more fully below in the section, “Reflection: An Individual Critical Thinking Process.” Sarah’s other learning transformations include: (1) elaborating her existing view of reflective practice and professional development by making connections to action research, resulting in greater commitment to her school’s professional development program; (2) learning new frames of reference, such as data analysis and evidentiary argumentation, by drawing from her experiences with reader response theory as an English teacher; (3) changing her point of view about her telementee as a result of her research project, discovering a young woman of mental maturity and complexity; and (4) changing her view of herself, discovering that she was not the independent learner she had believed herself to be and leading her to look for reasons both within herself and in the educational system of which she was a product. In the Sarah-instructor dyad, the focus of the co-construction of meaning and knowledge was research on the telementoring project. This is discussed more fully below in the section, “Co-Reflection: An Intersubjective, Social Critical Thinking Process.”
Reflection: An Individual Critical Thinking Process

This section addresses reflection as a critical thinking process in the DIACOR Framework, as highlighted in Figure 18.

Figure 18. DIACOR Framework: Focus on Reflection

- **CO-LEARNER RESOURCES**
  - (includes instructor)
  - Self-Efficacy
  - (Affective, Cognitive)
  - Experience, Knowledge, Understanding, Motivation

- **DIALOGIC INQUIRY & CO-REFLECTION**
  1. Learning Processes: A Narrative that is Cognitive, Affective, Interactional, and Transformational.
  3. Activities: use information to co-construct knowledge and construct, use, and improve representational artifacts.

- **LEARNING OUTCOMES**
  - (includes instructor)
  - Higher Self-Efficacy, Transformational Experience, Transformed Understanding

The view of many researchers, theorists, and practitioners that reflection is a key factor in learning has been confirmed by this study. The use of reflection skills emerged as the critical indicator of individual cognition. Seven key features of reflection were identified in the students’ discourse, supported by previous work on reflective inquiry and reflective practice (Dewey, 1910; Boud et al., 1985a; Schon, 1983). These features were the guide for identifying aspects of reflection in student learning. I analyzed how consequential events (transformational learning experiences) led to results (learning outcomes) using a plot structure consisting of: (1) being confronted with a challenging question or situation, (2) dealing with feelings/emotions related to the challenge, (3) bringing experience into the thinking/reflecting process, (4) reframing perspective through bridging the concrete and the abstract, (5) making a leap of thinking, (6) integrating the new knowledge cognitively and affectively, (7) with implications for future action.

Student writings that exhibited all of the seven key features pointed to significant individual learning transformations. The final papers are the best examples of writing that exhibits all of the key features in abundance. These writings were correlated with: (1) student self-reports about their most significant learning transformations, given on the final questionnaire and in the final interviews; and (2) the complicating action of the primary narrative. The critical point to note is that effective learning of action research came through facing and resolving a personally challenging question, confirming the conclusions of others about the value of inquiry learning (as discussed in Chapter 2). Ruth’s case demonstrates that
facing and overcoming obstacles leads to personal empowerment. At various times during the course, Sarah noted that facing and managing negative emotions with help during the process were critical for the learning to continue. The affective result was higher self-efficacy and a sense of accomplishment and success for both students.

Chapter 5 examined Ruth’s most significant learning sub-narrative, her process of self-discovery about the influence of learning style on her teaching and learning. The plot consists of the seven key features of reflection, as summarized in Chart 39. This sub-narrative clearly indicates the importance of both the affective and cognitive aspects of the reflection process. The complicating action in the sub-narrative is highlighted in the chart.

**Chart 39. Ruth: Summary of Reflection Sub-Narrative (Revisited)**

<table>
<thead>
<tr>
<th>Seven Key Features of Reflection</th>
<th>Ruth’s Story of Self-Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being confronted with a challenging question or situation</td>
<td>Confronted evidence of her bias in favor of visual learners</td>
</tr>
<tr>
<td>Dealing with feelings/emotions related to the challenge</td>
<td>Irritated with past students &amp; action research instructor, felt valued as a learner in the action research course, felt vulnerable facing her weaknesses, desired self-growth and empowerment</td>
</tr>
<tr>
<td>Bringing experience into the thinking/reflecting process</td>
<td>Examined her thoughts, feelings, and behavior as a teacher, mentor, and student</td>
</tr>
<tr>
<td>Reframing perspective through bridging the concrete and the abstract</td>
<td>Used evidence and metaphors to understand that her view of herself as a good teacher who accommodated diverse learners was inaccurate</td>
</tr>
<tr>
<td>Making a leap of thinking</td>
<td>Redefined good teacher to include the importance of self-awareness, reflection, and professional development</td>
</tr>
<tr>
<td>Integrating the new knowledge cognitively and affectively</td>
<td>Confirmed that she had the personal power, wisdom, and confidence to continue learning, growing, and becoming a good teacher as she had redefined it</td>
</tr>
<tr>
<td>With implications for future action</td>
<td>Planned to teach with multiple strategies while introducing students to new strategies to cope with a wide range of learning situations</td>
</tr>
</tbody>
</table>

Chapter 6 examined Sarah’s most significant learning sub-narrative, the building of a virtual relationship with her telementee. The plot consists of the seven key features of reflection, as summarized in Chart 40. This sub-narrative also clearly indicates the importance of both affect and cognition in reflection. The complicating action in the sub-narrative is highlighted in the chart.
<table>
<thead>
<tr>
<th>Seven Key Features of Reflection</th>
<th>Sarah's Story of Learning a New Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being confronted with a challenging question or situation</td>
<td>Perceived an inability as an online librarian to help Corel complete her senior project</td>
</tr>
<tr>
<td>Dealing with feelings/ emotions related to the challenge</td>
<td>Fear of failure; frustration over the ambiguity of her role as a telementor; pleasure in exchanging ideas, experiences, and feelings with her telementee</td>
</tr>
<tr>
<td>Bringing experience into the thinking/reflecting process</td>
<td>Examined the communication through her experiences as a classroom teacher to understand Corel and recognize how she had transferred teaching goals and interpersonal strategies from the classroom to the virtual setting</td>
</tr>
<tr>
<td>Reframing perspective through bridging the concrete and the abstract</td>
<td>Examined the evidence with a researcher’s eyes and identified other telementoring roles - supportive listener, teacher, co-learner</td>
</tr>
<tr>
<td>Making a leap of thinking</td>
<td>Recognized that relationship building, not coaching information literacy skills, was the achievement to be valued</td>
</tr>
<tr>
<td>Integrating the new knowledge cognitively and affectively</td>
<td>Accepted and valued her most important role as supportive listener</td>
</tr>
<tr>
<td>With implications for future action</td>
<td>Recommended improvements for more successful future telementoring and senior projects</td>
</tr>
</tbody>
</table>

Reflection can be conducted differently according to individual preference and purpose. Van Manen (1977) suggests three levels that are widely used to distinguish among types of reflectivity. Technical reflection focuses on examining skills, strategies, and methods used to reach predetermined goals. Practical reflection focuses on the methods to reach goals and also on examining the goals themselves. Critical reflection raises questions about the broader moral, ethical, and social assumptions underlying the goals, often with a call for change or reform. Mason (2001: 17) suggests a fourth type: psychological reflection is a movement inward toward self-awareness, sensitizing oneself to notice situations in which alternative actions are possible, and changing practices by changing one’s view of oneself. Based on a synthesis of these views, I identify four types of reflection: (1) technical; (2) practical/deliberative; (3) psychological; and (4) social/critical.

As discussed in Chapters 5 and 6, Ruth used primarily psychological reflection to learn about action research and conduct her research project, while Sarah used primarily practical/deliberative reflection. Both students used narrative as a tool to self-scaffold their learning of action research but in different ways. Ruth
used metaphors as narratives while Sarah used concrete stories from her personal experiences (see Chart 41 for a comparison of the students’ use of these reflection strategies).

**Chart 41. Comparison of Students’ Use of Reflection**

<table>
<thead>
<tr>
<th>Reflection Strategy</th>
<th>Ruth</th>
<th>Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection Type</td>
<td>Psychological</td>
<td>Practical/deliberative</td>
</tr>
<tr>
<td>Narrative as a</td>
<td>Metaphor as narrative</td>
<td>Concrete stories from</td>
</tr>
<tr>
<td>Thinking Tool</td>
<td></td>
<td>personal experience</td>
</tr>
</tbody>
</table>

Chapters 5 and 6 have extensively discussed the students’ use of these strategies. Here, a comparison of Ruth’s and Sarah’s writings on the same topic may serve as a reminder of how they gave evidence of different types of reflection and different uses of narrative to self-scaffold their learning. Chart 42 presents an excerpt from Ruth’s February 3 module writing on the topic of impartiality.

**Chart 42. Type of Reflection and Use of Narrative: Ruth on Impartiality, 2/3/04**

Frustration overwhelmed me as I searched in my kitchen drawers cluttered with rubbish and useless utensils. Why is searching for something so simple so difficult? As I asked myself that, I experienced a lightbulb moment related to what Mason touched upon regarding impartiality. As quoted by Mason, “The observation of others is coloured by our inability to observe ourselves impartially ... which suggests that impartiality starts with ourselves, for otherwise everything we think we are seeing in others may be a reflection of ourselves.” As I “uncluttered” my kitchen drawers, found a “home” for utensils so they wouldn’t be scattered in numerous drawers, and stacked dishes of similar use together, everything finally came together. Just like my kitchen drawers, impartiality is impossible unless one “unclutters” one's account of an event by suppressing explanation, justification or as Mason says, “any use of emotive terms.” Without the clutter of things that didn’t belong there and by ordering the things that should belong there, finally I was easily able to find what I needed. It felt great to be able to open the drawer with confidence that what I needed to find, would be there. I feel the same applies to impartiality when you unclutter it. If you are able to suppress the need to “account for” or “justify” your actions, what is revealed is a deeper understanding of what happened and a confidence that emerges that reveals the truth behind the layer of self-doubt and need to constantly justify one’s actions.

Who knew cleaning out my cabinets would lead me to this aha. But it just goes to prove that when you take “notice,” at what you are doing, why you are doing it; deeper understandings and connections can come at the most unexpected moments.

As discussed in Chapter 5, Ruth describes how she clarified her understanding of impartiality by relating it point-by-point to her experience of cleaning out her kitchen cabinet. This experience unexpectedly triggered insights into the dimensions of this difficult concept. Her active self and reflective self were at work simultaneously. She uses this commonplace experience as a narrative metaphor to shed new light on impartiality, exploring the metaphor and the concept to test for meaningful connections and
probe for deeper meanings. As she completes her task of cleaning her cabinet, simultaneously completing her parallel mental task of clearing her mind of confusion related to impartiality, she states that “everything finally came together.”

The characteristics of psychological reflection are evident. Rather than seeking practical ways to apply the concept of impartiality, Ruth sought a deeper understanding of the concept and of herself - what she was doing and why she was doing it. The affective aspects of the reflection process are evident in the movement from frustration to satisfaction and from self-doubt to self-confidence.

This is only one example of those examined in Chapter 5 that provide evidence that Ruth engaged primarily in psychological reflection. Her self-reports throughout the course exhibit the features of this type. She focused on understanding and developing her own internal authority, as evidenced by her deep questions about her own beliefs and values, her statement that she needed to stand up for herself everyday (as her mentee, Jessica, did), and her rejection of self-sacrifice in favor of self-growth as the belief most likely to benefit those she was responsible for.

Like Ruth, Sarah also discusses the difficulties of achieving an emotionally detached, nonjudgmental view in her January 28 module writing on impartiality (see Chart 43).

Chart 43. Type of Reflection and Use of Narrative: Sarah on Impartiality, 1/28/04

<table>
<thead>
<tr>
<th>Sometimes we let our emotions get in the way and our emotional response inhibits us from actually seeing something else that is going on - seeing what we need to see. Yesterday my son was cutting out pictures for a collage and I noticed that he also cut his brand new Nemo t-shirt by accident. My emotions got in the way in this instance whereas, an impartial observer would have noted that he indeed cut out the pictures he had wanted to cut out and he stuck with this task for over 10 minutes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think it is difficult, but we can be trained to be as impartial as possible - or at least to keep our impartial observations separate. If we have something concrete to look for - count how many times I reprimand, versus praise, a student - I think impartiality is easier. In my collegial coaching training that I have just started we aim to keep our emotional, judgemental responses at bay and instead, lead our partner through a series of clarifying questions or we rephrase what we hear them say so that our partner can learn to self-reflect. In this situation, I'm learning that my goal is to help my partner come to his/her own realizations about whatever &quot;issue&quot; or goal he/she has established rather than to add my two cents.</td>
</tr>
</tbody>
</table>

Like Ruth, Sarah also used concrete stories from her personal experiences to come to a better understanding of impartiality. However, rather than using a single story as a metaphor to clarify her thinking about the characteristics of impartiality, Sarah selected from her store of experiences those which helped her see what impartiality might look like in practical action. She first speculates on how and why
she might have responded less emotionally to her son’s cutting his new t-shirt by accident. She then relates the practice of impartiality to her collegial coaching training and discovers strategies that she can apply to the use of impartiality in her research.

The practical focus of Sarah’s reflection is evident. Rather than seeking a deeper understanding of herself, she sought to understand the practical applications of impartiality. This is only one example of those examined in Chapter 6 that provide evidence that Sarah engaged primarily in practical/deliberative reflection. As an experienced reflector, Sarah was able to combine the use of different types of reflection in a practical/deliberative approach. She elaborated her existing view of reflective practice and professional development by using technical reflection to examine her past behavior in the light of criteria derived from action research. She learned new frames of reference, such as data analysis and evidentiary argumentation, by using technical reflection to draw from her experiences as an English teacher and by actively co-reflecting with her instructor. She changed her point of view about her telementee and critically probed the conditions of the telementoring of the senior projects through questioning, evaluating, empathizing, and deliberating with the instructor. She used psychological reflection to discover that she was not the independent learner she had believed herself to be. Finally, she used social/critical reflection to critique the educational system that she believed influenced her to be a passive learner. What distinguishes Sarah’s reflection as practical/deliberative is the combination of a focus on concrete and practical goals rather than basic self- or social change, her strong sense of a guiding inner authority, and her desire to reach understandings and solutions through deliberation.
Co-Reflection: An Intersubjective, Social Critical Thinking Process

This section addresses co-reflection as a critical thinking process in the DIACOR Framework, as highlighted in Figure 19.

**Figure 19. DIACOR Framework: Focus on Co-Reflection**

- **CO-LEARNER RESOURCES (includes instructor)**
  - Self-Efficacy
  - Affective, Cognitive
  - Experience, Knowledge, Understanding, Motivation

- **DIALOGIC INQUIRY & CO-REFLECTION**
  3. Activities: use information to co-construct knowledge and construct, use, and improve representational artifacts.

- **LEARNING OUTCOMES (includes instructor)**
  - Higher Self-Efficacy,
  - Transformational Experience,
  - Transformed Understanding

I have defined *co-reflection* as a collaboratively undertaken reflective process, consisting of the intellectual and affective activities in which two or more individuals engage to explore their experiences in order to lead to new intersubjective understandings and appreciations.\(^{33}\) Characterizing affect in terms of activity and interaction clarifies that, through emotions, one participates more deeply and personally in the collaborative critical thinking process. To respect, trust, and show sincerity, for example, are affective activities in this conception. Co-reflection uses some or all of the seven key features of reflection and exhibits four interactional characteristics: (1) sharing of experience and relevant information; (2) achievement of intersubjective understanding through collaborative meaning making; (3) synergy between relationship building and co-reflection based on respect, trust, sincerity, and concern; and (4) teacher as co-learner (see Figure 17).

Through co-reflection, individuals collaboratively weigh reasons, arguments, and supporting evidence and examine alternative perspectives to achieve a clearer understanding by drawing on collective experience (Mezirow, 2000: 10-11). The goal is to “transform our taken-for-granted frames of reference … to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action” (op cit.).

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\(^{33}\) This definition is an extension of the definition of reflection developed by Boud et al. (1985a).
affective dimension plays a key role in co-reflection: “Effective participation in discourse and in transformative learning requires emotional maturity – awareness, empathy, and control – what Goleman (1998) calls ‘emotional intelligence’ – knowing and managing one’s emotions, motivating oneself, recognizing emotions in others and handling relationships – as well as clear thinking” (op cit.).

Other terms associated with co-reflection are co-construction of knowledge, collaborative meaning making, intersubjective understanding, and group cognition. 34 **Co-construction of knowledge** refers to knowledge that is interactively attained in discourse (broadly construed to include all meaningful signs) through a synergy of individual ideas and perspectives that results in a whole greater than the sum of these parts. Learning involves both individual and group processes. The sub-narrative analyses of learning in this study focus on reflection as an individual critical thinking process and co-reflection as an intersubjective, social critical thinking process. There is considerable interplay between them. It is generally the conceptual products of knowledge co-construction that are later presented publicly as information. Knowledge co-construction usually “involves constructing, using and progressively improving representational artifacts of various kinds with a concern for systematicity, coherence and consistency” (Wells, 1999: 89).

**Collaborative meaning making** is closely related to co-constructing knowledge. The distinction is that collaborative meaning making indicates more strongly the affective significance of the collaborative learning process, while knowledge co-construction deals more strongly with the intellectual or conceptual aspects. Individuals engage in meaning making with others in an attempt to extend and transform their collective understanding with respect to some aspect of a jointly undertaken activity.

**Intersubjective understanding** refers to the results of the processes of co-constructing knowledge and collaborative meaning making that is deeper, more personal, and more immediate than the public products of these processes. In his sociocultural theory of education, Gordon Wells positions understanding as the goal of education and defines it as the result of collaborative meaning making:

Understanding differs from knowledge building in being more personal and immediate. Whereas the latter, of necessity, requires that meaning should be made explicit, understanding is typically more holistic and intuitive; and where knowledge building is often temporarily detached from primary activity, understanding is deeply implicated in action, as it occurs, since it is in terms of our understanding of the possibilities for, and constraints on, action in a setting that we decide how to act. Put more generally, it is our understanding that constitutes the interpretive framework in terms of

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34 These articulations were synthesized from Mezirow (2000), Stahl (forthcoming), and Wells (1999).

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which we make sense of new experience and which guides effective and responsible action. Thus, although first-hand experience provides an essential basis for understanding, it needs to be extended and reinterpreted through collaborative knowing, using the informational resources and representational tools of the wider culture. (ibid., p. 84-85)

While this view of understanding recognizes the collaborative nature of this achievement for the individual, intersubjective understanding at its deepest levels can be considered a mutually constructed frame of reference that is deeply implicated in mutual action and that helps group members make sense of new experience within the group context. Such understanding guides effective and responsible mutual action.

**Group cognition** refers to cognition that takes place primarily in group processes of interpersonal interaction (Stahl, forthcoming). In Stahl’s view, group cognition is situated and contextual:

It is a social product of the interaction of groups—not primarily of individuals—discussing and acting in the world in culturally mediated ways. Individuals who are socialized into the community learn to speak and understand language as part of their learning in order to participate in that community. In the process, they internalize the use of language: e.g., as silent self-talk, internal dialog, rehearsed talk, narratives of rational accountability, senses of morality, conflicted dream lives, habits, personal identities and their tacit background knowledge largely preserved in language understanding. In this story, cognition takes place primarily in group processes of inter-personal interaction, including mother-child, best friends, husband-wife, teacher-student, boss-employee, extended family, social network, gang, tribe, neighborhood, community of practice, etc. The products of cognition—*thoughts*—exist in discourse, symbolic representations, meaningful gestures, patterns of behavior; they persist in texts and other inscriptions, in physical artifacts, in computer databases, in cultural standards and in the memories of individual minds. Individual cognition emerges as a secondary effect, although it later seems to acquire a dominant role in our introspective narratives. (op cit.; italics added)

Stahl (in press) further discusses shared meaning making in terms of the cognitive qualities of interactions visible through videotape recordings, while Suthers (forthcoming) discusses “the interactional accomplishment of intersubjective learning in small groups.” Both authors use the term “social interaction” to indicate primarily collaborative cognitive activities. As discussed in Chapter 2, I take a broader meaning of the term “social interaction,” including not only the co-construction of knowledge as a collaborative intellectual activity, but also the affective qualities and activities involved in relationship building, particularly where mentoring takes place. The results of these collaborative intellectual and affective interactions are new intersubjective understandings and appreciations.

**Dyadic Co-Reflection Sub-Narratives**

The use of reflection and co-reflection skills emerged as the critical indicator of individual and group cognition. Student writings (final papers) that exhibited an abundance of the seven key features of
reflection pointed to more significant individual learning transformations, as summarized above. Co-
reflection draws from individual reflection, as well as the four interactional characteristics: (1) sharing of
experience and relevant information; (2) achievement of intersubjective understanding through
collaborative meaning making; (3) synergy between relationship building and co-reflection based on
respect, trust, sincerity, and concern; and (4) teacher as co-learner (see Figure 17). The significance of the
dyadic co-reflection interactions were determined using two criteria: (1) nature and degree of individual co-
learner transformations in frames of reference, and (2) nature and degree of intersubjective understandings
reached through co-reflection. Chapters 5 and 6 show that exchanges that contributed significantly to the
students' final papers exhibited the four interactional characteristics. Thus, the students’ two final papers
are seen as among the most significant products of group as well as individual cognition. The third highly
significant product of group cognition was the final version of the course website.

Because of the predominant focus on individual learning outcomes in most educational studies
(including this study), group cognition has not been well explored, despite the philosophic traditions and
learning theories that point to the social nature of learning (Stahl, in press). Stahl describes group cognition
as taking place primarily within group processes of interpersonal interaction. In this view, group cognition
is both the process and product of interpersonal interaction mediated by language, broadly construed to
include all meaningful signs. In this study, dyadic interactions that exhibited a greater number of the
characteristics of co-reflection provided more definitive evidence of the process and products of group
cognition. Co-reflection can thus be seen as central to both individual and group cognition.

The reflective self can take two stances in the processes of co-reflection, depending on level of social
interaction. Regardless of level, the reflective self operates according to Vygotsky’s (1978: 88) assumption
that “human learning presupposes a specific social nature and a process by which [individuals] grow into
the intellectual life around them.” Immersion in intellectual life involves interaction with the thoughts,
feelings, and experiences of others who may or may not be co-present in the learning group.

In the first stance – tacit co-reflection – the reflective self engages in inquiry without seeking direct
feedback during the process. In this case, the process of co-reflecting, attaining intersubjective
understanding, and co-constructing knowledge is subtle and indirect. It begins with a response to others
who are brought to mind through reading, memories of previous interactions, or vicarious experience. The products of the reflective self can make a valuable contribution to group cognition in online learning environments when records of thoughts, feelings, and actions remain visible to co-learners as potential sources for further reflection. The distinction made between individual reflection and tacit co-reflection is that the latter emphasizes changes in frames of reference of the co-reflectors (e.g., student and teacher) and the achievement of intersubjective understanding through tacit means such as nonverbal interactions with affective dimensions. The second stance — active co-reflection — is more overtly interactional and discursive. Active co-reflection provides more opportunities for relationship building than tacit co-reflection.

The Ruth-instructor dyad largely exemplified the first stance. Ruth used the course to develop her reflection skills. As instructor, my belief in the importance of self-awareness and reflection led to the introduction of these concepts in the first module of the course. Ruth responded with an apparent awakening to the importance of reflection that resonated throughout her module writings, journal entries, final paper, and final course comments. In her journals, she described a greater awareness of her perceptions, values, and teaching practices that was powerful and empowering. In an early journal entry, she noted that the course readings heightened her awareness and led to deep questions about her beliefs and values. By investigating her learning style through her online interactions with her instructor and her high school mentee, she changed her view of herself as a teacher. At the end of the course, the component she ranked as most important for her learning progress was journaling. Through online writings, the power of her insights extended beyond herself to the learning group. Both Sarah and the instructor read Ruth’s online writings and acknowledged their value for expanding their thinking.

The Ruth-instructor co-reflection process was largely subtle and indirect. In her completed assignments, Ruth responded to the resources the instructor had put in place as part of the course design — structure, materials, activities, learning objectives, and stated values and intentions. After the instructor improved the course website to accommodate Ruth’s visual learning style, Ruth stated that her motivation to learn increased. She began commenting again on the instructor’s comments on her wiki pages, and she accessed the website more frequently.
In the Ruth-instructor dyad, the foci of the co-construction of knowledge and collaborative meaning making were: (1) the nature of action research and (2) the influence of learning style differences on teaching and learning. A garden metaphor for the research process became an intersubjectively meaningful conceptual artifact that served three functions. First, it was the instrument used for co-reflection because it became a shared reference for the research process. Second, changes in the metaphor contributed by each member of the dyad provided evidence of group cognition. Through mutually observed, incremental additions, each member contributed unique dimensions to a richer understanding of the nature of action research. At the end of the course, the metaphor, introduced by the instructor, grew in richness and intersubjective meaning not through direct discussion but through Ruth’s innovative use of the metaphor to structure her final paper. Third, the metaphor indicated a deeper complex of thoughts and feelings, not easily expressed, which comprised the intersubjective understanding reached about the research process. The representational artifact that was instrumental in these transformations was Ruth’s final paper.

The instructor’s accommodation of Ruth’s learning style through making changes to the website was one of the consequential events that led Ruth to change her view about how her learning style influenced her teaching. Dealing with student-instructor learning style differences resulted in transformations in Ruth’s and the instructor’s views of themselves and each other as teachers and learners. Without intentional dialogue about learning style differences, the dyad achieved a common experience of self-examination, change in self-view, and intention to change teaching practices that resulted from the interactions – partly verbal, but also behavioral and emotional. The features of the Ruth-instructor tacit co-reflection processes are summarized in Chart 44.
Chart 44. Features of Ruth-Instructor Tacit Co-Reflection (Revisited)

<table>
<thead>
<tr>
<th>Ruth’s Contributions: Knowledge of Learning Styles</th>
<th>Instructor’s Contributions: Knowledge of Action Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requested graphic representations of the research process to aid in her understanding as a visual learner</td>
<td>Reorganized the wiki to accommodate Ruth’s visual learning style, including posting a garden metaphor of the research process</td>
</tr>
<tr>
<td>In final paper, appreciated and elaborated on the garden metaphor of the research process and analyzed herself as a visual learner and teacher</td>
<td>Gained deeper understanding of garden metaphor from Ruth’s final paper and of how visual learners use metaphor to scaffold learning cognitively and affectively</td>
</tr>
<tr>
<td>In final paper, closely examined thoughts and feelings related to self-change as a visual learner and teacher</td>
<td>Re-examined thoughts and feelings related to self-change as a verbal learner and teacher through reading Ruth’s final paper</td>
</tr>
</tbody>
</table>

In contrast to Ruth, Sarah was practiced at reflecting and peer coaching. She used the seven key features of reflection as she actively co-reflected with the instructor as her primary partner. She and the instructor regularly exchanged email messages throughout the process of focusing her topic, clarifying action research concepts, coding email messages exchanged with her telementee, analyzing data, and writing her final paper. As she was writing her final paper, Sarah undertook a significant co-reflection activity. To gain a deeper understanding of action research, she reread, reflected on, and responded to all of the chat summaries that the instructor had created to date, giving the instructor further food for reflection. Sarah identified in her chat review some of the means and benefits of co-reflection – alternative interpretations, reformulation of one’s thinking, and reexamination of assumptions. She also made a clear connection and distinction between reflection and co-reflection. Sharing her reflections helped her to see things from different vantage points and attain a better, less limited, less judgmental perspective. She demonstrated that online communication supports the internalization of group-mediated learning by providing a persistent record of socially constructed knowledge that is available for use when an individual’s learning readiness is improved.

In the Sarah-instructor dyad, the focus of the co-construction of knowledge and collaborative meaning making was research on Sarah’s telementoring relationship with Corel. The examination of this relationship was a mutual research interest and in part a collaborative endeavor. Sarah contributed from her experiences as a classroom teacher of students like Corel. She understood Corel from this experience, adapted her face-
to-face teaching skills to the online environment, analyzed the email data with deep questions and insights to perceive a role change from librarian to supportive listener, and provided revealing insights on her roles and the nature of online communication. As a co-learner, the instructor learned how telementors effectively communicate with high school students by being open, accepting, empathetic, humorous, and accessible. Sarah also helped the instructor deepen her understanding of the nature of constructivist learning.

The instructor assisted Sarah by introducing the action research concepts and methods Sarah needed for her analysis. She mentored Sarah in action research, providing both cognitive and affective support. The instructor also provided readings and exercises aimed at guiding Sarah through the coding and analysis process. The instructor noticed that Sarah was developing a telementoring relationship with Corel apart from Sarah’s role as a librarian and provided background information on the telementoring project. The deepening of both the collaborative learning and the relationship are evidenced by the evolution of the instructor’s role from learning facilitator to mentor to co-learner.

The contributions to co-reflection by the members of the dyad are summarized in Chart 45. These features indicate the process of dyadic group cognition as well as the intersubjective understanding reached about the telementoring relationship. The artifact that best represented the co-construction of knowledge, collaborative meaning making, and intersubjective understanding about the telementoring relationship was Sarah’s final paper.

**Chart 45. Features of Sarah-Instructor Active Co-Reflection (Revisited)**

<table>
<thead>
<tr>
<th>Sarah’s Contributions: Knowledge of Facilitating Learning for High School Students</th>
<th>Instructor’s Contributions: Knowledge of Action Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understood Corel from teaching experience</td>
<td>Introduced concepts and methods needed for analysis</td>
</tr>
<tr>
<td>Adapted F2F teaching skills to telementoring</td>
<td>Mentored use of AR and provided emotional support</td>
</tr>
<tr>
<td>Analyzed data with deep questions and insights</td>
<td>Provided readings and exercises for Sarah’s needs</td>
</tr>
<tr>
<td>Saw a role change from librarian to supportive listener</td>
<td>Noticed a telementoring relationship developing</td>
</tr>
<tr>
<td>Provided revealing insights on her roles and the nature of online communication</td>
<td>Gave background on the senior project and the telementoring</td>
</tr>
</tbody>
</table>

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This Sarah-instructor active co-reflection provided more definitive evidence of the process and products of dyadic group cognition than the tacit co-reflection exhibited in the Ruth-instructor dyad. The Ruth-instructor co-construction of knowledge and intersubjective understanding achieved about the research process was indicated by the evolution of the garden metaphor and the changes in self-view articulated by Ruth in her final paper. Compared to this, the extensive Sarah-instructor online dialogues, with their explicit statements of thoughts and feelings, are a clearer indication of the co-construction of knowledge and intersubjective understanding achieved through all four interactional characteristics of co-reflection: (1) sharing of experience and relevant information; (2) achievement of intersubjective understanding through collaborative meaning making; (3) synergy between relationship building and co-reflection based on respect, trust, sincerity, and concern; and (4) teacher as co-learner.

It seems logical to conclude that tacit and active co-reflection result in differing levels of co-constructed knowledge and different degrees of intersubjective understandings reached among co-reflectors. Ruth focused her efforts on self-change as a teacher. One can speculate that if she and the instructor had more actively co-reflected on the changes they made as teachers to accommodate learning styles different from their own, their intersubjective understanding about the topic and each other would have been richer, fuller, and more explicitly in evidence. The active co-reflection between Sarah and the instructor regarding her research on the high school telementoring project is clearly visible in the evidence. From my perspective as instructor, this greatly enriched my understanding of the needs of high school students and the successful facilitation and interpersonal strategies that are used by skilled high school instructors like Sarah to successfully support the building of learning relationships. Sarah also noted the benefits in increased knowledge and understanding that resulted from active co-reflection. In an email message Sarah sent to me as researcher after reading this report (12/27/04; quoted with her permission), she noted: “The Dialogic Inquiry Model and Data Sources chart you created in chapter three caught my attention. If you had shown me that one year ago, I maybe would not have ’gotten’ it; but now, I can see how everything we did fits together and I especially think that because we constructed knowledge together and reframed our perspectives with input from each other, my project and thinking was much greater.”
As discussed below in the section, "Course Communication Media and Sociability," Sarah appeared to be at ease and able to co-reflect regardless of online medium (email, chat sessions, wiki pages, or journal entries). She communicated in a spontaneous, conversational style and was self-aware and clear about her feelings and motivations. This provided a strong basis for co-learner co-reflection. Sarah's background as a high school English teacher and her previous relationship with the instructor were probably influential factors in her ability to be open. However, Ruth had more difficulty expressing herself online. She was most expressive face-to-face and two important co-reflection incidents occurred face-to-face: Ruth's request for graphic materials about the research process, and the refocusing of her research question toward the end of the semester. Ruth's preferred means of online communication were her journals and weekly written assignments. This may have been due to the fact that, as a visual learner, she stated that she needed time to process and revise her words before posting them online. Chat was not a comfortable communication medium for her. In her weekly assignments posted on wiki pages and in her journal entries submitted through email, Ruth presented polished writings that indicated careful thought and reflection. The use of the asynchronous media for these purposes allowed Ruth to take the time she needed to process, reflect, and revise her writing.

**Emotional Support for Action Research Challenges**

As discussed in Chapters 5 and 6, the action research process was cognitively and emotionally challenging for both Ruth and Sarah. The instructor responded to these challenges by assisting the students in identifying problems, setting workable goals, and selecting and implementing strategies for action. She also aimed to motivate Ruth and Sarah and to help them harness their personal strengths, as well as providing guidance, encouragement, and support through communication that was characterized by acceptance, empathy, and genuineness.

As discussed previously, in Ruth's case of predominantly tacit co-reflection with the instructor online, the most significant instance of cognitive and affective support provided by the instructor occurred at a face-to-face meeting on April 17 when Ruth refocused her research topic. Ruth noted that she left that meeting feeling "refreshed and refocused" and that the instructor had helped her strategize alternatives when she had "no idea how [she was] going to do it." Because Ruth did not actively seek help or initiate
co-reflection online, as instructor, I felt I worked harder at providing guidance, encouragement, and support with Ruth than with Sarah. Such support and acceptance may have been particularly important for Ruth, who was engaged in psychological reflection that involves emotional risks. As Ruth noted in her final paper: “Assessing yourself leaves you vulnerable yet empowered. Your weaknesses are revealed when engaged in self-reflection, yet the uncovering of these links allows you to strengthen them and improve them so they no longer remain weaknesses.”

In Sarah’s case of active co-reflection with the instructor online, there are more examples of the instructor providing cognitive and affective support because Sarah initiated dialogue, asked questions, sought help, and enjoyed co-reflecting online. Two examples of such instructor support are the Sarah-instructor dialogue on questioning strategies and the dialogue on Sarah’s telementor role discussed in Chapter 6.

Ruth and Sarah indicated how challenging the action research process was, and both acknowledged and appreciated the instructor’s role in providing cognitive and emotional support, as summarized in Chart 46. From their comments, it is evident that the action research process needs emotional support as well as cognitive guidance.

**Chart 46. Instructor’s Cognitive and Emotional Support for Action Research Challenges**

<table>
<thead>
<tr>
<th>Affective Dimension</th>
<th>Ruth</th>
<th>Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action Research Challenges</strong></td>
<td>“I feel that I spent a lot of time at the top of the hill preparing to go down the hill, thinking about how, and when, etc. Now, I’ve started my descent down the hill and I have no time to think about how I’m going to land. I’m freefalling and perhaps the greatest lesson of all is just live it, experience it, both the bumps and bruises, and pray for a smooth landing.” (2/17/04)</td>
<td>“I think that you [instructor] just kept me going … if it was more of an independent project where you folks sent me off and I was supposed to be doing something on my own … I can see how I would have had to withdraw or take whatever the bad grade was. I really need that reinforcement. I didn’t know that.” (6/16/04)</td>
</tr>
<tr>
<td><strong>Support from Instructor</strong></td>
<td>“Instructor provided supportive and risk-free online environment (chat, email) that I could freely ask questions without feeling intimidated. The instructor gave support as process got difficult and provided constructive feedback that helped me make it through this process.” (6/12/04)</td>
<td>“I really like how patient you [instructor] were and encouraging, how you asked me good questions to get me to think about things, how you took so much time to respond to my journals or the emails. I always felt that you were really thinking and looking at things, and that your perspective was so helpful to me.” (6/16/04)</td>
</tr>
</tbody>
</table>
**Emotional Visibility and Building Relationships**

The discussion in the previous section points to the importance of providing emotional support for learning challenges. Open communication and emotional visibility online provide the opportunities to provide such support. They also encourage the relationship building that supports co-reflection and the risk taking that is sometimes demanded by action research.

A fundamental factor that affects openness is the online learner’s attitude toward online communication. For Ruth, online media were initially a barrier to her learning. One reason she found chat difficult was the lack of immediate, visual, affective feedback. She wanted reassurance that she had been understood through smiles and enthusiastic nods. Not knowing made her uncomfortable and anxious. After realizing that her discomfort in a previous online course was blocking her ability to use the chat medium effectively, she took a more positive attitude. A supportive learning environment that allowed her to express herself freely also apparently mitigated the difficulties. Her attitude toward the wiki seems to have changed after it was reorganized and new visual material added. This attitudinal change was probably influenced by her appreciation of being accommodated as a visual learner.

Sarah, on the other hand, stated that she quickly overcame her anxieties about chat during the first chat session and also noted that the process of rapidly writing email messages seemed to aid her ability to reflect. (Student comments indicating attitudes toward online communication are compared in Chart 51 in a subsequent section of this chapter, “Online Activities: The Value of Simple, Flexible Software.”)

It should be noted that Ruth and the instructor did not know each other prior to the action research course, while Sarah and the instructor had established a relationship in a previous LIS course. In the final interview on June 17, Sarah noted the importance of trust: “[O]ne reason I was able to email you and talk, communicate with you the way I was is that I trusted you. I knew you as an instructor and I felt … even though I got to know you much better now, I think that I felt that trust.”

The importance of Sarah’s openness and emotional visibility in the email exchanges with the instructor was illustrated with numerous examples in Chapter 6. Sarah demonstrated her skills in interpersonal communication, applied in the online environment, with beneficial effects for her learning.
Sarah’s communication throughout the course was characterized by openness, honesty, visibility, empathy, humility, gratitude, and the inseparability of the cognitive and affective dimensions of learning. Sarah asked questions and gave context when she was confused or needed help. She gave immediate positive feedback when the instructor took action that was helpful for her learning and expressed gratitude for the help she received. She “thought out loud” when she wrote her emails or journals, helping the instructor see more fully and clearly her thinking processes and emotional reactions. She did not hesitate to examine herself and admit fears and weaknesses when she found them. By being expressive and detailed, she made herself visible to the instructor both cognitively and affectively and provided opportunities for the instructor to give cognitive and affective support, as well as build a relationship that overcame the barriers of the electronic medium. Sarah also provided a model of effective online communication that the instructor as co-learner used to improve her own interpersonal and communication skills online. The following excerpt from an email message sent by Sarah on February 15 shows some of these qualities:

When I read the three points necessary for a credible, qualitative study in the Janesick article, page 108, I began to panic a little - how will I show validity, triangulation, etc.? Self-talk shushed this immediate doubt so I could go on to think about my essential/ driving questions. Still, whisperings of anxiety linger - will my question/research/thoughts “measure up” and then I wondered – to or for whom? Ultimately, am I taking the 699 for myself – for the experience and practice of studying my experiences? If that is the answer, then I feel okay. I’m a little nervous to share with Joyce [instructor] just because I don’t want her to feel let down by my inability to process everything she has shared and guided me through. (2/15/04)

Sarah also demonstrated these interpersonal skills and affective qualities in her email messages to Corel, whom she had never met, in her efforts to establish a trusting, caring, and supportive relationship with her telementee, as exemplified in the following excerpt from an email sent to Corel on May 18:

Wow—I can’t believe you folks are reading another book—after the AP exam? I know the AP teacher at our school feels the students really need a break so she has them help her plan/organize the giant end of the year yearbook party where kids get their yearbooks and DJs come etc. She argues that the AP kids work so hard all year that they are near emotional/intellectual breakdowns after the AP test. Still, The Stranger is a curious book. I read it in French originally and then in English and I remember being struck by the apathy of the first line—“Mother died today, or maybe yesterday...” something like that. I was shocked that someone wouldn’t feel more “something” at the death of his mother. Obviously, I was a naive little girl. Do you know the band The Cure? They wrote a song about The Stranger. Actually, existentialism is something that I read a lot of in high school—you might try Sartre’s No Exit. It is a play about his idea of what hell is. I also liked Camus’ The Plague. Anyway—sorry you have to read another book at the end of the year! Get the answers at PinkMonkey.com (Shhhhhh—don’t tell).

I hear you about your creative writing class—isn’t it frustrating when we feel a class is a waste of time? You must have been one of the students who came with a talent and interest in creative writing and maybe the teacher tailored the class to the students who didn’t have these interests/talents?
One of my biggest fears as a teacher was that students would say, “I learned nothing in your class.” I always tried to ask the students what they wanted to work on or learn or improve and then I tried to bring those things into the class. Still, that is a lame teacher question isn’t it? I remember in one of my graduate classes the professor asked us this and I had no idea what the class was about or what any of it meant and I couldn’t make a list of what I wanted to learn because I felt I knew nothing and “duh” wanted to learn it there. (5/18/04)

Sarah’s openness and emotional visibility encouraged relationship building with both her telementee and her instructor and showed the importance of the synergy between relationship building and co-reflection. In the action research course, the active co-reflection between Sarah and the instructor based on respect, trust, sincerity, and concern contributed to relationship building and, in turn, was supported by a trusting relationship. As discussed above, this kind of active co-reflection provided more definitive evidence of the process and products of dyadic group cognition than the tacit co-reflection exhibited in the Ruth-instructor dyad.

**Importance of Feeling Valued as Learners**

An important part of building relationships that support learning and co-reflection is that students feel valued as learners. As noted previously, Ruth’s learning style was significantly different from both Sarah’s and the instructor’s learning styles. Both students recognized the differences between them. Ruth implied her recognition of this in her final course comment about reading Sarah’s module writings: “I liked reading Sarah’s responses to the same question. It gave me an appreciation of how experiences shape future action” (6/12/04). While she enjoyed reading Sarah’s writings, she did not comment on any of Sarah’s wiki pages, though this had been encouraged at the start of the course. Ruth also indicated her recognition of the learning style differences in the final interview: “When you had that [final class] meeting, I said that I wanted more deadlines, yeah? And Sarah said that it was good that she didn’t have more deadlines. So as a teacher, you’d have that conflict because you’re going to have students that say, ‘I want this due here, I want this due here.’ And on the other hand you have students who say, ‘No, I feel very claustrophobic with that kind of format.’ So I can see conflict” (6/12/04).

Sarah also recognized the differences. In the final interview, she noted that although she had difficulty with the readings by John Mason, she saw that Ruth had responded differently: “But I don’t think that’s Ruth, though. I really sensed that she did well with [the Mason readings] … like in the chats, I thought,
‘Wow, how did she get that? Or, look at the analogy she made or the metaphors ... oh, I never thought of that’” (6/17/04). Sarah also commented that the chats helped her recognize other basic differences: “On the chat discussions, they were really interesting in that ... I could just see how Ruth and I were just seeing things so differently. And even when she was talking about her project, I think I wasn’t understanding it like it really was. Because I’d think of some things I’d want to say about her project, but it didn’t seem to be something that could help her, push her along. So it’s curious” (6/17/04).

Ruth’s expression of her needs as a visual learner provided the opportunity for the instructor to learn from Ruth how to better support visual learners online. Changes in content and website presentation were made to better adapt the presentation of concepts for Ruth’s learning style. Ruth noted her appreciation of the revisions at the end of the course: “As far as the comment on the wiki, it was really, really good. It was uncluttered. It was organized. Everything was there ... You did a really good job of adapting the format as we went along. So it was changing. It wasn’t that you just threw out everything and started all over. I could see that you were really trying to make the learning happen, to make it as easy as possible” (6/12/04).

Sarah, whose learning style was similar to the instructor’s, appreciated the streamlined, visual presentation but also valued being allowed to learn at her own pace without strict deadlines. At the end of the course, both students provided spontaneous comments about the importance of feeling valued as learners (see Chart 47).

### Chart 47. Importance of Feeling Valued as Learners

<table>
<thead>
<tr>
<th>Student</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruth</td>
<td>“By allowing students to learn through methods they are comfortable with, we acknowledge that how they learn is important. I experienced this firsthand as a telementee, as additional visual material was added to the instructional Web page. It affected me cognitively and emotionally. I now not only had a mental picture that I could refer to, but the feeling of being acknowledged transformed into increased motivation and a desire to learn more.” (5/14/04)</td>
</tr>
<tr>
<td>Sarah</td>
<td>“As a student, I appreciated your [instructor’s] encouraging, patient, supportive role. You gave me space to flounder yet you also gave me words of support when you saw that I needed them. While you probably saw some glitches and errors in my process, you gave me space to learn at my own pace. I felt valued as a student and I think this is crucial for learning to occur.” (7/17/04)</td>
</tr>
</tbody>
</table>
Comparison of Student Activity and Dyadic Interaction

Statistical data provide further evidence of tacit and active co-reflection in the two dyads. Table 5 and Figure 20 show the comparison of the students' course activity (in number of words) in the following categories: (1) LIS 699 course email, (2) telementoring email sent by the graduate students to their high school mentees, (3) chat sessions, (4) journals, (5) module work (i.e., weekly written assignments posted on wiki pages), (6) research proposal, and (7) final paper. In all categories except telementoring email, Sarah produced significantly more words than Ruth. The difference is most evident in the category of course email, where Sarah produced 23,090 words to Ruth's 7,580 words. This is an indication of Sarah's active co-reflection in contrast to Ruth's tacit co-reflection. Factors encouraging Sarah to be more communicative online include her verbal learning style, the establishment of a trusting relationship with the instructor in a previous course, her preference for practical/deliberative reflection, and her need for and enjoyment of co-reflection.

Table 5. Comparison of Students' Course Activity
(In number of words estimated from QSR text units)

<table>
<thead>
<tr>
<th>Course Activity</th>
<th>Ruth</th>
<th>Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td>699 Course Email</td>
<td>7,580</td>
<td>23,090</td>
</tr>
<tr>
<td>Telementoring Email</td>
<td>4,100</td>
<td>2,920</td>
</tr>
<tr>
<td>Chats</td>
<td>6,650</td>
<td>9,780</td>
</tr>
<tr>
<td>Journals</td>
<td>6,970</td>
<td>13,900</td>
</tr>
<tr>
<td>Module Work</td>
<td>4,690</td>
<td>9,520</td>
</tr>
<tr>
<td>Research Proposal</td>
<td>1,080</td>
<td>1,120</td>
</tr>
<tr>
<td>Final Paper</td>
<td>6,870</td>
<td>12,720</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>37,940</strong></td>
<td><strong>63,050</strong></td>
</tr>
</tbody>
</table>
An even clearer indication of the difference between the Ruth-instructor tacit co-reflection and the Sarah-instructor active co-reflection can be seen in the comparison of the number of words the dyads exchanged, as shown in Table 6 and Figure 21. The Ruth-instructor dyad exchanged a total of 31,740 words, while the Sarah-instructor dyad exchanged more than twice as many words at 72,720.

Table 6. Comparison of Student-Instructor Interaction through Email & Journals
(In number of words estimated from QSR text units)

<table>
<thead>
<tr>
<th>EMAIL/JOURNAL CONTENT</th>
<th>Ruth to Instructor</th>
<th>Instructor to Ruth</th>
<th>Sarah to Instructor</th>
<th>Instructor to Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course business</td>
<td>5,270</td>
<td>8,810</td>
<td>6,430</td>
<td>9,230</td>
</tr>
<tr>
<td>Action research</td>
<td>1,750</td>
<td>810</td>
<td>3,920</td>
<td>5,120</td>
</tr>
<tr>
<td>Research project</td>
<td>5,060</td>
<td>7,270</td>
<td>16,310</td>
<td>15,870</td>
</tr>
<tr>
<td>Telementoring</td>
<td>2,370</td>
<td>230</td>
<td>8,680</td>
<td>4,830</td>
</tr>
<tr>
<td>Personal</td>
<td>100</td>
<td>70</td>
<td>1,650</td>
<td>680</td>
</tr>
<tr>
<td>TOTAL</td>
<td>14,550</td>
<td>17,190</td>
<td>36,990</td>
<td>35,730</td>
</tr>
</tbody>
</table>
Figure 21. Comparison of Student-Instructor Interaction through Email & Journals
(In number of words estimated from QSR text units)

Table 7 shows the number of days each student accessed the wiki per month during the course. These days were charted on monthly calendars. Sarah’s access of the wiki was fairly evenly spread throughout the week, while Ruth tended somewhat to access the wiki on the day or two before assignments were due.

Table 7. Comparison of Student Wiki Access
(In number of days)

<table>
<thead>
<tr>
<th>Month</th>
<th>Ruth</th>
<th>Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>February</td>
<td>11</td>
<td>21</td>
</tr>
<tr>
<td>March</td>
<td>10</td>
<td>24</td>
</tr>
<tr>
<td>April</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>May</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>TOTAL</td>
<td>55</td>
<td>92</td>
</tr>
</tbody>
</table>
Table 8 shows the number of emails each student sent to the instructor per month. These include emails with student-initiated questions as well as emails that were primarily responses to instructor follow-up questions on student work. Sarah sent more than twice as many email messages to the instructor. The possible reasons for this difference are discussed below in the section, “Course Communication Media and Sociability.”

Table 8. Comparison of Number of Emails Sent by Students to Instructor

<table>
<thead>
<tr>
<th>Month</th>
<th>Ruth</th>
<th>Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>February</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>March</td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>April</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>May</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>TOTAL</td>
<td>51</td>
<td>103</td>
</tr>
</tbody>
</table>

Typology of Reflection, Co-Reflection, and Research Approaches

To place reflection and co-reflection in a broader perspective, I propose that co-reflection takes different roles with different types of reflection. Based on a synthesis of views of reflection, reflective practice, and action research (Grimmett et al., 1990; Kemmis, 1985; Mason, 2002; McKernan, 1996; Van Manen, 1990), I propose a sensitizing typology of four types of reflection, the role co-reflection may play in each type, and associations with different epistemological stances and research approaches (see Chart 48). The typology is not meant to be a theoretical typology of mutually exclusive categories, but rather a speculative, heuristic tool for educators, teacher educators, and researchers regarding the various dimensions of reflective practice. Even considering the significant differences between the students in this study, I am well aware of the fact that there were only two students. The typology presented in the following chart is an attempt to acknowledge this limitation and to use the preliminary, tentative findings of this study to sensitize me to recognize alternative conclusions in future research.

The four types of reflection are: (1) technical, (2) practical/deliberative, (3) psychological, and (4) social/critical (Mason, 2001; Van Manen, 1977). Technical reflection focuses on examining skills, strategies, and methods used to reach predetermined goals directed by external authority. Reflection is seen as the instrumental mediation of action (Grimmett et al., 1990). Practical/deliberative reflection focuses on
the methods to reach goals and also on examining the goals themselves through questioning assumptions, predispositions, values, and consequences (Mason, 2001: 18). Reflection is seen as deliberating among competing views of teaching (Grimmett et al., 1990). Psychological reflection is a movement inward toward self-awareness, sensitizing oneself to notice when alternative actions are possible, and changing practices by changing one’s view of oneself. Reflection is seen as a process of self-sensitizing and self-awareness (Mason, 2001). Critical reflection critiques the broader moral, ethical, and social assumptions underlying the goals in order to achieve greater justice and emancipation from distorting or limiting norms, social structures, and ideologies. Reflection is seen as ideological, both individual and collaborative, and as a means of reconstructing experience and social life (Grimmett et al., 1990; Kemmis, 1985).

This typology may explain Ruth’s use of tacit co-reflection and Sarah’s use of active co-reflection. Ruth engaged primarily in psychological reflection, and her self-reports throughout the course exhibit the features of this type. She focused on understanding and developing her own internal authority. Because it was important for Ruth to emphasize self-reflection, I speculate that her co-reflection activities were predominantly tacit. As an experienced reflector, Sarah was able to combine the use of different types of reflection in a practical/deliberative approach. What distinguishes Sarah’s reflection activities as practical/deliberative is the combination of a focus on concrete and practical goals rather than basic self- or social change, her strong sense of a guiding inner authority, and her desire to reach understandings and solutions through deliberation. The action research course did not include students who used predominantly technical reflection or social/critical reflection. These aspects remain an area for further study.
**Chart 48. Types of Reflection, Co-Reflection, and Research Method Preference**

<table>
<thead>
<tr>
<th>Reflection Type</th>
<th>Technical</th>
<th>Practical/Deliberative</th>
<th>Psychological</th>
<th>Social/Critical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal</strong></td>
<td>Improve practice through individual behavioral change focused on practical goals set by external authority</td>
<td>Improve practice through individual conceptual &amp; behavioral change focused on practical goals questioned &amp; negotiated with one's peers</td>
<td>Improve practice through changing a habit of mind about oneself</td>
<td>Improve practice through emancipatory social change</td>
</tr>
<tr>
<td><strong>Reflection Methods</strong></td>
<td>Questioning one's behavior in the light of externally derived standards, assumptions, values, models</td>
<td>Questioning the assumptions, predispositions, values, or consequences of the actions of self, one's group, or social institutions</td>
<td>Questioning own values &amp; assumptions; achieving self-awareness; sensitizing to notice situations &amp; alternative actions based on internally developed standards</td>
<td>Critiquing ethical, social, political values in order to change institutional practices that constrain freedom of action or limit the efficacy of action</td>
</tr>
<tr>
<td><strong>Source of Knowledge</strong></td>
<td>External authority</td>
<td>Mixed: external, internal, collective authority</td>
<td>Internal authority (self)</td>
<td>Mixed: internal, collective authority (achieved through critiquing limiting ideologies)</td>
</tr>
<tr>
<td><strong>Co-reflection Activity</strong></td>
<td>Mainly tacit co-reflection, to seek information &amp; knowledge from external authority</td>
<td>Mainly active co-reflection, to achieve understanding &amp; diverse perspectives for thinking &amp; action</td>
<td>Mainly tacit co-reflection, to understand &amp; develop internal authority to guide improved practice</td>
<td>Mainly active co-reflection, to achieve collective understanding &amp; collective efficacy</td>
</tr>
<tr>
<td><strong>Epistemological Stance</strong></td>
<td>Positivism, behaviorism</td>
<td>Mixed: positivism, behaviorism, naturalism, constructivism</td>
<td>Naturalism, constructivism</td>
<td>Naturalism, constructivism</td>
</tr>
<tr>
<td><strong>General Research</strong></td>
<td>Quantitative preferred</td>
<td>Mixed methods</td>
<td>Qualitative preferred</td>
<td>Qualitative preferred</td>
</tr>
<tr>
<td><strong>Action Research</strong></td>
<td>Scientific, technical</td>
<td>Practical, deliberative</td>
<td>Practical, deliberative</td>
<td>Critical, emancipatory</td>
</tr>
</tbody>
</table>

**Dyadic and Small Group Co-Reflection: Differing Conditions and Effects**

At the whole group level, the evidence indicates that co-reflection was not an actively undertaken group process. Group interaction took place mainly in the chat sessions. The infrequent student-to-student email communication was used to negotiate responsibility for assignments or change chat session dates. Students
did not use email or the wiki page comment feature to comment on each other’s writings or provide feedback on the research projects. This may be attributable to three factors: (1) student differences created initial barriers to the sharing of ideas that were difficult to alleviate by the use of only online media for communication; (2) the instructor focused her efforts on individual mentoring rather than group co-construction of knowledge; and (3) participants did not have the time, energy, or motivation to devote efforts to providing feedback on each other’s work.

While small group size may be advantageous when strong commonalities encourage sharing, it can be disadvantageous if there are major differences in outlook and learning style between only two students. Had the students been more similar, group co-construction of knowledge might have been more naturally encouraged. As noted in a previous section of this chapter, both students recognized the differences between them. Under these conditions, the learning facilitator can choose among several strategies to support the learning process: (1) one-to-one coaching or mentoring; (2) active encouragement of group co-reflection and co-construction of knowledge through such strategies as assigning peer coaching and critiques or student-to-student debates; or (3) a combination of both. In this case, the instructor chose the first strategy as being the least onerous for the students who were already heavily burdened with course readings, assignments, and the telementoring of the high school students. As noted above, the students also had diverse goals and engaged in different types of reflection. Whole group learning and an increase in collective efficacy were not explicit goals of the course. Had the group coalesced around the goal of collectively improving the conditions for telementoring the senior project, learning transformations and higher collective efficacy might have occurred.

At the whole group level, co-reflection would have been essential if the participants had been jointly conducting a single research project. Even though Ruth and Sarah were “telementoring” high school students under a common framework, the actual conditions for each case of telementoring varied greatly: (1) the high school students were markedly different in personality, career goals, and skills; (2) Ruth had bi-weekly face-to-face contact with her mentee and the supervising high school librarian, who had also been Ruth’s mentor as a beginning librarian; and (3) Sarah communicated with her telementee solely through email and had very little contact with the supervising librarian.
Interestingly, one commonly held view failed to take on intersubjective meaning during the course. One of the telementoring challenges for Sarah was the vague nature of her role as a telementor. She noted in her final paper, “Ultimately, I believe that the school library media specialists and I needed to establish some parameters rather than to let the process define itself” (5/11/04). When Sarah was writing her final paper, as instructor I shared some of the challenges I had faced in the implementation of the telementoring aspect of the senior project, in response to issues Sarah had raised regarding her role. I had assumed that Ruth, who had regular face-to-face contact with the supervising librarian, had more guidance and clarity as a mentor. In the final interview, Ruth revealed that she and her mentee had also faced similar challenges: “I think the whole telementoring, defining telementoring, and the senior project was kind of in flux, that part was really hard ... And I know even before I started in January, I could tell she [Jessica] was a little frustrated with the process, that it wasn't very clear ... her senior project process ... was so helter skelter, and it wasn't logical” (6/12/04).

While sharing confusions and frustrations regarding the telementoring activities may have helped the group to more clearly understand the nature of the problem, identify possible solutions, and take action to better achieve the senior project’s stated goals, as instructor I was hesitant to do this out of respect for the supervising librarian’s lead role in guiding the high school students, as well as her extremely busy schedule of wide-ranging professional activities. From her statements to me in four face-to-face meetings and four telephone conversations from September 2, 2003 to January 30, 2004, I was confident that she had the best interests of the students in mind. Sarah and Ruth may also have been reluctant to discuss this for similar reasons.

Paradoxically, I believe that the failure to discuss the negative aspects of the telementoring project had an unspoken positive intersubjective meaning for the group. I believe that each participant (this was certainly true in my case) struggled individually to reframe her perspective by looking for strengths rather than weaknesses in the relationship between mentor and mentee, the supervising librarian’s actions, and the situation as a whole. This is an example of the connected knowing position of the women’s way of knowing epistemological theory. This position aims for understanding through trust, empathy, and relationship (see Chapter 3).
If this analysis is correct, the tacit intersubjective understanding held by the group was the value of understanding through trust, empathy, and relationship. The students’ final comments seem to provide evidence of the personal benefits of holding such a value. Several of Ruth’s comments in the final interview and on the final questionnaire indicate that facing and successfully overcoming challenging obstacles had led her to an increase in perceived self-efficacy and a sense of self-confidence. While her comments certainly refer to facing the challenges of her research project, it is likely that she is also referring to the senior project. In the final interview, she stated, “Now I see challenges not as brick walls, I see them as opportunities to make things better. I think I never would have realized that had I not been part of this project” (6/12/04). As a result of the course, she noted this change in self-perception: “I see every experience, positive or negative, as a learning opportunity. I now see myself as a vehicle to help others ‘see’ reflection as an important part of being and becoming ‘human’” (6/12/04). She felt that Jessica had benefited in the same way from overcoming her struggles: “I think that’s true of life, that you’re going to walk into situations where it’s not how you like things but you’ve got to make the best of it. To see what she [Jessica] got out of it, too, that was very valuable. It’s something that she can take with her, and the confidence she got out of it, you cannot replace” (6/12/04).

In a substantial email discussion that Sarah and the instructor had about the senior project, Sarah showed great empathy for the supervising librarian’s position and possible factors influencing the situation. Her peer coaching skills further helped the instructor to see the benefits of the telementoring for all participants, despite the lack of progress on the senior projects. In an email message to the instructor in April, Sarah noted: “I know that I would have had a skewed sense of my role in Corel’s life if I wasn’t doing coding of my emails to her. I really thought that we didn’t communicate too often or very effectively. And although my communication with her was not effective for your dissertation because I didn’t do my job of leading her through the information literacy process, I do think that aspects of the communication were effective for both she and myself as learners” (4/15/04). In her final course comments, she elaborates:

I loved telementoring Corel, and I think it helped me see my strengths as a teacher, or as a supportive listener. And it showed me my gaps as a librarian, and I could see what I felt I should be doing that I felt hard ... It was interesting to see how Corel and I were mirroring each other, in that she was procrastinating, I was procrastinating ... I guess it kind of reinforced in me how the information
process and the gathering, synthesizing, and analyzing and the evaluating information is the same all across the board everywhere ... for my son, who’s a little five-year old, and then for Corel in high school, and me as a graduate student and a librarian ... it just reinforced the value of the information process to me. (6/17/04)

For myself as instructor and researcher, the challenges I faced and overcame with the refocusing of my dissertation project and the discoveries made through this case study of the online action research course have helped me realize that I would have wished for no other outcome.

**Online Activities: The Value of Simple, Flexible Software**

This section addresses the activities component of the DIACOR Framework, as shown in Figure 22.

**Figure 22. DIACOR Framework: Focus on Learning Activities**

The use of the DIACOR Framework and narrative analysis has revealed the centrality of co-reflection to online learning, the co-construction of knowledge, and collaborative meaning making under the conditions of this study. How social resources, in all of their diverse forms, are key to motivating, shaping, and sustaining the learning process has also been described. The role of the social software was to support and augment social resources. The flexibility and freedom provided by the combined wiki-style collaborative software and simple email and chat programs effectively supported inquiry learning and discovery learning by allowing learners to freely and easily create their own web pages and adapt to different communication and learning styles.

**Course Activities**

In the process of using information to co-construct knowledge and construct, use, and improve representational artifacts, the course involved a number of more specific activities that included weekly chat sessions or face-to-face meetings, email exchanged among co-learners (primarily student-instructor),
telementoring a high school student, journaling, weekly assigned readings, weekly module assignments, and conducting a research project that involved independent reading. The instructor established a rhythm for the activities through a weekly routine of instructor-posed questions and assignments, student posting of completed assignments, and discussion of student-posed questions in the chat sessions. Optional comments could be made via the wiki page comment feature and email.

At the end of the course, the students commented on the relative importance of these activities for their learning. As noted in Chapters 5 and 6, Ruth filled out a questionnaire and ranked the activities in order of importance, while Sarah did not fill out the questionnaire or do the ranking but instead gave her comments verbally. The students’ comments are summarized in Chart 49. While these comments have been discussed in Chapters 5 and 6 within the context of each student case, comparing the comments reveals similarities and differences in the students’ experiences. Both felt that the face-to-face meetings were important but for different reasons. Ruth found it easier to ask questions and gain immediate feedback, while Sarah appreciated the different learning opportunities provided by the instructor such as analyzing passages from the weekly readings to clarify concepts and offer different interpretations. Such activities were possible because of the visibility, audibility, and simultaneity available face-to-face but not in chat.

Both students appreciated the new insights that emerged through journaling and recognized different points of view in each other. Both found the research process to be challenging. Ruth, who had little experience with reflective practice and professional development, found that the abundance of information on her topic caused her to reconsider and revise her research focus several times. Sarah, who was more experienced with reflective practice, found her research focus early in the semester and had the confidence to wait until the end of the semester to do most of the independent reading for her research project.

Both also appreciated the experience of telementoring a high school student but learned different things. Ruth, who was inexperienced at mentoring, learned the importance of building a learning relationship, while Sarah, already experienced in mentoring, learned more from the relationship itself – her strengths as a teacher, weaknesses as a librarian, and the value of the Kuhlthau model as a guide for scaffolding information literacy skills.
<table>
<thead>
<tr>
<th>Course Activity</th>
<th>Rank</th>
<th>Ruth Comments (questionnaire 6/12/04)</th>
<th>Sarah Comments (interview 6/17/04)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face meetings</td>
<td>2</td>
<td>F2F meetings with Sarah and Joyce helped me remain on track; easier to ask questions in person and gain immediate feedback.</td>
<td>“I think it was important to have those face to face times … It was neat that you had activities for us those times. Different from just the opening chat or just speaking to the questions. I liked that.”</td>
</tr>
<tr>
<td>Chat</td>
<td>9</td>
<td>Difficult for me to sit still between responses; felt pressure to answer quickly.</td>
<td>“They were really interesting in that I could see how Ruth and I were just seeing things so differently … The chat did help me understand what was important in the reading, how it connected to what we’re doing, how we can use this information … And it was wonderful to be able to meet via chat because I didn’t have to drive down to UH.”</td>
</tr>
<tr>
<td>Email with instructor</td>
<td>3</td>
<td>Helped me to clarify questions; prompt responses were helpful in alleviating anxiety of not knowing.</td>
<td>“Email with you was so good because you just kept me energized, and encouraged me, and you gave me things to think about, and I really appreciated how quick the turnaround was. You were there. I thought that must have been so time consuming for you to address all my emails, but I really valued that. And I think that you just kept me going … I really need that reinforcement. I didn’t know that. So that was really helpful. Helpful too when you pointed out little things [that] I had missed with Corel … At one point you told me that I kind of turned the emails into journals, I think that as I was typing there I was thinking and things were happening.”</td>
</tr>
<tr>
<td>Telementoring your mentee</td>
<td>4</td>
<td>Able to form casual relationship with mentee; allowed me to see how important building a relationship with student is for learning (both mentee and teacher). [Ruth’s mentoring done primarily face-to-face.]</td>
<td>“Loved” telementoring Corel; helped her see her strengths as a teacher (supportive listener), and gaps as a librarian; reinforced that the information process is similar for all learning levels; everything was too new and information was difficult to absorb, so she failed to use the Kuhlthau model, but now sees its usefulness, particularly the affective part. [Sarah’s telementoring done completely online.]</td>
</tr>
<tr>
<td>Journals</td>
<td>1</td>
<td>Provided roadmap of how I’ve changed and what I’ve learned; valuable “glue” that cemented what I’ve learned.</td>
<td>“I really like journaling and I don’t know why I was so delinquent with that. But yet when I sat down to do it, I felt like I had some different ‘aha’s’ and I remember getting excited.”</td>
</tr>
<tr>
<td>Course Activity</td>
<td>Ruth Rank</td>
<td>Comments (questionnaire 6/12/04)</td>
<td>Sarah Rank</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------</td>
<td>---------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Writing your weekly module assignments</td>
<td>5</td>
<td>I liked reading Sarah’s responses to the same question. It gave me an appreciation of how experiences shape future action.</td>
<td>NA</td>
</tr>
<tr>
<td>Research project</td>
<td>6</td>
<td>Challenging, but opened my eyes to the power of reflection; also helped me understand the difficultness and complexity of AR.</td>
<td>NA</td>
</tr>
<tr>
<td>Weekly assigned readings</td>
<td>7</td>
<td>Helped me to focus on module questions; gave different perspectives on similar issues; like reading comments on my responses.</td>
<td>NA</td>
</tr>
<tr>
<td>Independent readings for your research project</td>
<td>8</td>
<td>Made me realize the abundance of information leads to selecting &amp; deselecting &amp; refining topic; important to research process.</td>
<td>NA</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>NA</td>
</tr>
</tbody>
</table>
Regarding their attitudes toward online media, Ruth appears to have struggled with the characteristics of the media as communication tools, while Sarah’s answers focus on what and how she learned using the media. This difference is discussed in the next section.

**Course Communication Media and Sociability**

The action research course provided four media for communication: (1) face-to-face class meetings (total of four); (2) chat session class meetings (total of twelve); (3) email; and (4) wiki pages. In terms of Clark’s theory of common ground (discussed in Chapter 2), these media offered different configurations of constraints and costs (see Chart 50). The face-to-face meetings allowed a full range of verbal and nonverbal visual and auditory cues to support efficiency in communication. Though more costly in most areas, the online media allowed reviewability and revisability, which aided understanding in ways not possible under normal face-to-face conditions.

**Chart 50. Grounding Constraints and Costs of Communication Media in LIS 699**

(Adapted from Clark and Brennan, 1991: 142)

<table>
<thead>
<tr>
<th>Medium</th>
<th>Constraints</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face meetings</td>
<td>Copresence, visibility, audibility, cotemporality, simultaneity, sequentiality</td>
<td>Minimal</td>
</tr>
<tr>
<td>Chat sessions</td>
<td>Copresence, cotemporality, sequentiality, reviewability</td>
<td>Higher costs in all categories compared to face-to-face</td>
</tr>
<tr>
<td>Email</td>
<td>Reviewability, revisability</td>
<td>Higher costs in most categories, although paying higher formulation costs may have resulted in lower reception and understanding costs</td>
</tr>
<tr>
<td>Wiki pages</td>
<td>Reviewability, revisability</td>
<td>Higher costs in most categories, although paying higher formulation costs may have resulted in lower reception and understanding costs</td>
</tr>
</tbody>
</table>

The students used the communication media in different ways and with different preferences. As noted previously in Chart 49, both students valued the face-to-face meetings. Although there were four face-to-face class meetings, one was the first meeting to introduce the course and another was a final session to deal with questions related to the final paper and to do an informal course evaluation. Thus, of a total of 14 class modules focused on learning course content, the face-to-face meetings (two) constituted less than 15%. In addition, each student requested one private meeting with the instructor in April to discuss her research paper. Ruth especially valued the face-to-face meetings. Despite the fact that there
were few of these, she ranked them as second in importance to her learning in the course (following journals) because they helped her stay on track, and it was “easier to ask questions in person and gain immediate feedback.” It has been noted that two important incidents in the Ruth-instructor co-reflections took place during face-to-face meetings: Ruth’s request for graphic representations of the research process and the refocusing of her research question.

The students’ attitudes toward online communication differed significantly (see Chart 51). For Ruth, online media were initially a barrier to her learning: “The scary part is that when something is written as opposed to spoken, it can be taken in a different way … for me, I was very cautious about the way I wrote things, because it was open to interpretation” (12/8/03). A supportive learning environment apparently helped her become less fearful of expressing herself online: “[Instructor] provided supportive and risk-free on-line environment (chat, email) that I could freely ask questions without feeling intimidated” (6/12/04). In contrast, Sarah appeared to be at ease writing online: “At one point you told me that I kind of turned the emails into journals. I think that as I was typing there I was thinking and things were happening” (6/17/04).

Ruth struggled with the demands of chat: “I often find giving an answer on demand difficult, as I need to hear it out, revise it, think about it again and then share it” (4/18/04). Sarah appeared to quickly overcome her initial barriers to the chat technology and was able to easily express her thoughts and questions: “I was nervous about the chat initially … I was apprehensive of the technology … Once we got into the discussion, all my worries fell to the side. I could feel the wheels of my brain turning with the questions and observations” (1/27/04).

In her weekly assignments posted on wiki pages and in her journal entries submitted through email, Ruth presented polished writings that indicated careful thought and reflection. The use of the asynchronous media for these purposes allowed Ruth to take the time she needed to process, reflect, and revise her writing. The reviewability and revisability constraints of Clark’s grounding theory worked to her advantage in these instances.

Sarah appeared to overcome the social barriers caused by lack of visibility and audibility through explicit verbal descriptions of thoughts, feelings, and actions and the occasional use of emoticons. Regardless of online medium, she tended to use a spontaneous, conversational style. She was self-aware
and stated her feelings and motivations. This had great benefits for the instructor/researcher, as it clearly revealed Sarah’s successes and obstacles as a learner and can be likened to having one participant follow a think-aloud protocol throughout the course. Sarah commented that the online media might even have encouraged her to be more frank and open than she would have been in a face-to-face classroom environment. Sarah wrote long email messages encompassing many thoughts and feelings; she sent the instructor about 36,990 words via email and journals. Ruth wrote concise, businesslike messages; she sent the instructor about 14,550 words via email and journals. Ruth apparently carefully composed her thoughts before writing in order to avoid being misinterpreted. Sarah seemed to offer alternative interpretations in her original formulations to forestall or mitigate possible fault costs from misinterpretation.

As noted earlier, there was a considerable difference between the students in the number of days the wiki was accessed and email messages sent to the instructor. Ruth accessed the wiki a total of 55 days and sent 51 email messages to the instructor, while Sarah accessed the wiki 92 days and sent 103 messages to the instructor. Both students had busy professional and personal lives that may have affected the time they had available to spend online. Less frequent access can be associated with fewer messages and longer delays between turn-taking in asynchronous online media. Ruth’s less frequent access may be due to her discomfort with online communication, related to the costs of grounding identified by Clark. As noted in Chart 51, some costs appear to have affected Ruth more strongly than Sarah, especially the formulation, reception, understanding, start-up, delay, speaker change, display, and fault costs of online media. The heavy formulation cost of the chat sessions is clear from Ruth’s comments about her need to revise her formulations numerous times. In addition, not knowing the reactions of others in the chat sessions made her uncomfortable and anxious (delay costs): “When responses from other chatters took longer than I had anticipated, I often jumped to the conclusion that they either didn’t understand what I was trying to saying or didn’t agree” (5/14/04). However, Ruth noted one benefit of online media: “When distance is involved (physical or emotional), online communication allows you to continue to dialogue” (6/12/04).

In general, the online media presented more barriers to sociability than the face-to-face meetings, related to the costs of grounding discussed by Clark (see Chart 51).
Chart 51. Detailed Costs of Grounding in LIS 699
(Based on Clark and Brennan, 1991: 142-145)

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Face-to-Face</th>
<th>Chat</th>
<th>Email</th>
<th>Wiki (Website)</th>
</tr>
</thead>
</table>
| Formulation costs | • AR concepts were complex and challenging to understand and to formulate, but in different ways for Ruth and Sarah.  
• Compared to Sarah, Ruth seemed to more strongly prefer F2F.  
• However, Sarah indicated at the end of the course that she had expended significant formulation costs: “I just felt like I don’t want to face another computer again. So that’s kind of funny. So even though I can do it, and I liked the class that way, I just feel tired of the computer” (6/17/04). | • Both students typed and deleted responses before posting.  
• Ruth: “I often find giving an answer on demand difficult, as I need to hear it out, revise it, think about it again and then share it. I often write a message, erase it, write it again, erase it ... the discussion has already moved on ... so I erase it ... it really comes down to my need to process through” (4/18/04).  
• Sarah: “I was nervous about the chat initially ... I was apprehensive of the technology ... Once we got into the discussion, all my worries fell to the side. I could feel the wheels of my brain turning with the questions and observations.” (1/27/04)  
• Ruth stated that being misunderstood was a major concern. While this may have also concerned Sarah, she did not mention it. | • Sarah: “At one point you told me that I kind of turned the emails into journals, I think that as I was typing there I was thinking and things were happening” (6/17/04).  
• Ruth sent the instructor about 14,550 words via email and journals; Sarah sent about 36,990 words. A possible reason for the difference is that formulation costs were higher for Ruth than Sarah.  
• In contrast to Ruth’s attitude toward online learning, Sarah enjoyed using the wiki for learning. Sarah stated, “As a student, I learned that I like the virtual format for my learning ... I really liked putting my work in the wiki once I finally learned how to do it” (7/7/04). | • Ruth produced about 4,690 words on her wiki pages; Sarah produced about 9,520 words. A possible reason for the difference is that formulation costs were higher for Ruth than Sarah. |
Chart 51. (Continued) Detailed Costs of Grounding in LIS 699

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Face-to-Face (F2F)</th>
<th>Chat</th>
<th>Email</th>
<th>Wiki (Website)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding</td>
<td>• More costly for students to understand some words, constructions, and concepts</td>
<td>• Ruth: “What works ... is not only the size of the group, but ... a common set of readings that serve as the backdrop so that we can bring our different experiences to the table. Being a picture person who needs to ‘see’ what’s happening, what I ... do to accommodate this is to write down key comments or ideas ... I may doodle, draw a picture, a metaphor of a key idea, while I wait for responses” (4/18/04). Ruth ranked chat ninth in importance for her learning.</td>
<td>• Clark &amp; Brennan note that costs can be compounded when contextual cues are missing, e.g., in email that is not cotemporal or sequential. • However, reviewability of email (not possible F2F) aided in understanding. Sarah stated, “I liked that I could go back to read our chats or return to email ‘discussions’” (7/7/04).</td>
<td>• Viewing/reading the course website as a whole was harder than listening to verbal descriptions of course structure, content, and procedures, particularly for Ruth who asked for graphic representations of the research process. • Sarah stated, “I appreciated having the course ‘texts’ online and in PDF formats” (7/7/04).</td>
</tr>
<tr>
<td>costs</td>
<td>than others, regardless of medium (e.g., claims and warrants).</td>
<td>• However, Ruth valued the Mason readings that Sarah viewed as too philosophical. Sarah valued the coding readings that Ruth viewed as too technical.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• However, Ruth valued the Mason readings that Sarah viewed as too philosophical.</td>
<td>• Ruth stated that it was easier to ask questions in person and gain immediate feedback; she ranked F2F as third in importance for her learning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sarah valued the coding readings that Ruth viewed as too technical.</td>
<td>• Sarah: “They were really interesting in that I could see how Ruth and I were just seeing things so differently ... The chat did help me understand what was important in the reading, how it connected to what we’re doing, how we can use this information ... because of the [slow] pace ... I could go back into the article and think” (6/17/04).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ruth stated that it was easier (4/18/04). Ruth ranked chat ninth in</td>
<td>• Reviewability of chat (not possible F2F) aided in understanding. Sarah stated, “I liked that I could go back to read our chats or return to email ‘discussions’” (7/7/04).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chart 51. (Continued) Detailed Costs of Grounding in LIS 699

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Face-to-Face (F2F)</th>
<th>Chat</th>
<th>Email</th>
<th>Wiki (Website)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production costs</td>
<td>• Little effort needed for students to speak or gesture.</td>
<td>• More effort needed to produce communication by typing on the keyboard.</td>
<td>• More effort needed to produce communication by typing on the keyboard.</td>
<td>• More effort needed to produce communication by typing on the keyboard.</td>
</tr>
<tr>
<td>Reception costs</td>
<td>• Clark &amp; Brennan note that listening is generally easy, and reading harder, although it may be easier to read than to listen to complicated instructions or abstract arguments. • It also costs to wait while a speaker produces a turn.</td>
<td>• Reading chat messages was harder than receiving F2F verbal and nonverbal cues, particularly for Ruth. • Chat cost more to wait than F2F while a speaker produced a turn.</td>
<td>• Reading email was harder than receiving F2F verbal and nonverbal cues, particularly for Ruth. • Email cost more to wait than F2F or chat while a speaker produced a turn.</td>
<td>• Reading assignment instructions and posting completed assignments on wiki page was comparable to receiving printed instructions and submitting written assignments.</td>
</tr>
<tr>
<td>Start-up costs</td>
<td>• According to Clark &amp; Brennan, costs of starting up a new discourse are minimal in F2F where attention getting is easy.</td>
<td>• Start-up costs are greater than F2F but simultaneity makes start-up easier than via email.</td>
<td>• Start-up costs greater than F2F or chat, because communicator must get online access and start the message. Addressee may not read the message immediately. • Ruth sent the instructor a total of 51 email messages; Sarah sent the instructor a total of 103 messages. Ruth's lower number may be due to her discomfort with online communication.</td>
<td>• Start-up was regularized through a weekly routine of instructor-posed questions and assignments, student posting of completed assignments, and discussion of student-posed questions in chat sessions. • Optional comments could be made via the wiki page comment feature and email.</td>
</tr>
</tbody>
</table>
Chart 51. (Continued) Detailed Costs of Grounding in LIS 699

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Face-to-Face (F2F)</th>
<th>Chat</th>
<th>Email</th>
<th>Wiki (Website)</th>
</tr>
</thead>
</table>
| Delay costs  | • Clark & Brennan note that in cotemporal communication, delay costs are high; gaps before starting a conversational turn may be seen as dropping out of the conversation or disagreeing. In F2F, this is mitigated by nonverbal visual/auditory cues. Speakers may utter words that have to be revised; can be done immediately F2F. Delay costs often trade off with formulation costs.  
  • Ruth apparently carefully composed thoughts before speaking. Sarah offered alternative interpretations in her original formulations “to anticipate what my audience is thinking and … address all possible questions/criticisms” (2/15/04). | • Clark & Brennan note that in chat, delay costs can be high, as gaps before starting a conversational turn may be interpreted as dropping out of the conversation or disagreeing.  
  • Ruth: “When responses from other chatters took longer than I had anticipated, I often jumped to the conclusion that they either didn’t understand what I was trying to saying or didn’t agree” (5/14/04).  
  • Delay costs from typing, deleting, and retyping chat postings resulted in anxiety for Ruth. Difficult for Ruth to “sit still between responses; felt pressure to respond quickly.”  
  • Sarah was also conscious of long delays but used these to return to the readings. | • No delay costs in formulating utterances, but there are delay costs (such as anxiety) when email responses are not prompt, as Ruth noted. | • No delay costs in formulating utterances, but there are delay costs (such as anxiety) when assignments and comments on wiki pages are not prompt. |
| Asynchrony costs | • Clark & Brennan note that in F2F, communicators time their utterances and communication cues precisely.  
  • Ruth especially valued immediate verbal and nonverbal feedback. | • Clark & Brennan note that in chat, without copresence, visibility, audibility, or simultaneity, timing is much less precise. | • Clark & Brennan note that in email, without copresence, visibility, audibility, or simultaneity, and cotemporality, timing is not possible. | • Using wiki pages, without copresence, visibility, audibility, or simultaneity, and cotemporality, timing is not possible. |
Chart 51. (Continued) Detailed Costs of Grounding in LIS 699

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Face-to-Face (F2F)</th>
<th>Chat</th>
<th>Email</th>
<th>Wiki (Website)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaker change costs</td>
<td>• Clark &amp; Brennan note that F2F has few speaker change costs. In conversation, the general rule is one speaker at a time. F2F turn-taking is easy to arrange.</td>
<td>• In chat, the cost of changing speakers is higher than F2F. Chatters indicated a need to retain a turn through the use of ellipses (&quot;...&quot;) or the need to change speaker by asking a question of other chatters.</td>
<td>• Speaker change costs are higher than in F2F and chat. • Ruth accessed the wiki a total of 55 days and sent 51 email messages to the instructor; Sarah accessed the wiki a total of 92 days and sent 103 messages to the instructor. Ruth’s less frequent access may be due to her discomfort with online communication. Less frequent access leads to longer delays between turn-taking and fewer messages. • One effect of high speaker change costs is that people try to do more within a turn. Sarah wrote long email messages encompassing many thoughts and feelings; she sent the instructor about 36,990 words via email and journals. • Ruth wrote concise, businesslike messages; she sent the instructor about 14,550 words via email and journals.</td>
<td>• Speaker changes were regularized through a weekly routine of instructor-posed questions and assignments, student posting of completed assignments, and discussion of student-posed questions in chat sessions. • Optional comments could be made via the wiki page comment feature and email.</td>
</tr>
</tbody>
</table>
Chart 51. (Continued) Detailed Costs of Grounding in LIS 699

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<th>Type of Cost</th>
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<th>Chat</th>
<th>Email</th>
<th>Wiki (Website)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display costs</td>
<td>• Clark &amp; Brennan note that F2F, it is easy to point to, nod at, or present an object, and easy for listeners to indicate understanding.</td>
<td>• Gestures costly. Sarah replaced these with explicit verbal descriptions to present ideas and indicate understanding of others. Ruth needed time to process and reflect before presenting.</td>
<td>• Gestures costly. Sarah replaced these with explicit verbal descriptions to present her ideas and indicate understanding of others’ ideas. Ruth was succinct and far less explicit.</td>
<td>• Gestures costly. Ruth and Sarah (with more ease) replaced these with explicit verbal descriptions to present thoughts and feelings.</td>
</tr>
<tr>
<td>Fault costs</td>
<td>• Clark &amp; Brennan note the costs of producing an utterance fault or mistake: misunderstandings; looking foolish, illiterate, or impolite. To avoid these, speakers may elect to pay more in formulation costs. • Sarah offered alternative interpretations in her original formulations: “Regardless of the situation, I [try] to anticipate what my audience is thinking and [try] to address all possible questions/criticisms” (2/15/04).</td>
<td>• Ruth gave evidence of higher formulation costs to avoid fault costs: “I actually had a [previous] class that was totally online ... without face to face it was like shell shock … The scary part is that when something is written as opposed to spoken, it can be taken in a different way … for me, I was very cautious about the way I wrote things, because it was open to interpretation … I was so uncomfortable.” (12/8/03)</td>
<td>• Ruth apparently carefully composed thoughts before writing to avoid fault costs. • Sarah offered alternative interpretations in her original formulations to forestall or mitigate possible fault costs.</td>
<td>• Ruth apparently carefully composed thoughts before writing to avoid fault costs. • Sarah offered alternative interpretations in her original formulations to forestall or mitigate possible fault costs.</td>
</tr>
<tr>
<td>Repair costs</td>
<td>• Clark &amp; Brennan note that repairs take varying time and effort, and some are impossible to make. Because faults tend to snowball, speakers try to repair them as soon as possible. In cotemporal media, speakers often make their own repairs.</td>
<td>• Sarah offered alternative interpretations in her original formulations to avoid repair costs.</td>
<td>• Repair of Ruth-instructor misunderstanding over learning styles did not take place online, where the fault originally occurred, but rather F2F. • Sarah offered alternatives in her original formulations to avoid repair costs.</td>
<td>• Clark &amp; Brennan note that repairs made by others in non-cotemporal media can be costly. • Instructor’s reorganization of wiki a type of repair. • Ruth’s change of attitude toward online learning perhaps also a type of repair.</td>
</tr>
</tbody>
</table>
Several factors are likely to have influenced the ease and fluency with which Sarah used the text-based tools. First, as an English teacher, Sarah’s subject expertise was in knowing and teaching good writing skills. Second, she had already developed a trusting relationship with the instructor in a previous course. Third, she had no previous experience with a fully online course and presumably no preconceptions, either positive or negative, about how online course communication should be conducted. Thus, she could freely adapt the face-to-face interpersonal strategies that she had found successful in her teaching and learning. Sarah appeared to be equally at ease using chat sessions, wiki pages, journals, and email to express herself.

However, Ruth had more difficulty expressing herself online. There may be several reasons for this. First, she was an elementary school teacher whose specialty was teaching music. Second, she and the instructor had not developed a trusting relationship prior to the course. Third, Ruth was a visual learner and using text-based software led her to feel pressured and uncomfortable at having to write quickly, especially during the chat sessions. In other words, the costs of grounding were higher for Ruth than for Sarah.

In addition to the barriers to sociability caused by grounding costs, online communication and the presentation and management of content on the website were costly in time and effort. The greater time and effort needed to communicate and interpret messages online via email and chat slowed discussions and joint problem solving (i.e., formulation, production, and delay costs). Sarah characterized this as “slow motion discussion.” Prompt responses were important for keeping lines of communication open, providing clarification, and alleviating anxiety and uncertainty. Activities required more time to complete via online communication than face-to-face. Although Sarah appeared to be equally at ease expressing herself using all the online media, one of her final course comments indicates that the effort at compensating for the costs of grounding online communication had taken its toll: “I just feel tired of the computer” (6/17/04).

Considerable time was required for the instructor to create, maintain, and manage the website; provide electronic copies of course readings; and summarize individual and group learning paths. When inquiry learning drives the learning process, students are motivated to explore questions that are personally meaningful. This calls for individually tailored responses from the instructor to assist students in meeting their learning goals, understanding subject content, planning and conducting learning activities, identifying
problems and possibilities, helping them utilize their personal strengths, and providing encouragement and support. Even with only two students, as instructor I found conducting the course online was more time consuming than anticipated. Considering the costs of grounding identified by Clark, this is not surprising. With a large online class, I assume that the amount of time an instructor can devote to each student would diminish. This would require students to be active co-learners with each other and take on the responsibility for much of the work of building and maintaining an online community conducive to learning.

It is important to note that the students highly valued the opportunity to learn online. Ruth and Sarah appreciated the ability to participate in the course from home at flexible times. Both were mothers of young children. Sarah adopted a newborn during the semester and sometimes participated in the chat discussions with the baby on her lap.

**Supporting Usability and Sociability with Simple Software**

The wiki-style software, chat, and email programs afforded only basic functions. The wiki website offered basic features to enhance usability and navigation. Pages could be accessed via an alphabetical index of pages, a list of recently changed pages, user created hyperlinks, or a site-wide keyword search. Page creation and naming was ad hoc, necessitating periodic creation of meta-organizer pages to assist in conceptual organization and navigation. Other types of wiki-style software have different features to address this problem, such as more complex naming functions to allow for a simple hierarchical structure of pages. An overview of the various online communication functions and modes and associated issues of sociability and usability are summarized in Chart 52. The next sections of this chapter discuss how the software supported, enhanced, or impeded key learning and social functions.
### Chart 52. Supporting Sociability and Usability with Simple Software

<table>
<thead>
<tr>
<th>Function</th>
<th>Mode</th>
<th>Sociability Issues</th>
<th>Usability Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-to-one; Asynchronous interaction</td>
<td>Email</td>
<td>(1) Privacy-protected. (2) Useful for relationship building, mentoring, coaching, individual-specific issues. (3) Encourages more frank, open communication than face-to-face (F2F) class environment. (4) Allows dialogue to continue when physical or emotional distance might curtail F2F communication. (5) Affect expressed mainly through verbal descriptions rather than emoticons. (6) Communication more infrequent, time-consuming, arduous than F2F; requires more time to complete tasks. (7) Prompt responses provide clarification, alleviate anxiety. (8) Student differences: difficult for Ruth to be spontaneous without nonverbal cues; Sarah did not curtail her spontaneity.</td>
<td>(1) Convenience of working from home at any time is a major advantage. (2) Difficult to organize and manage information; this problem was addressed by extracting and publishing useful information on the wiki FAQs page.</td>
</tr>
<tr>
<td>One-to-many; Many-to-many; Asynchronous interaction</td>
<td>Email</td>
<td>(1) Public interaction. (2) Useful for community building, dealing with course-related issues. (Other sociability issues same as 3-8 above.)</td>
<td>Same as above.</td>
</tr>
<tr>
<td></td>
<td>Wiki pages</td>
<td>(1) Public presentation of individual ideas (e.g., student-created wiki pages). (2) Public presentation of co-constructed knowledge (e.g., chat summaries, module questions summary). (3) Useful for sharing ideas, community building, dealing with course-related announcements and issues. (4) Provides a public record of evolving ideas, activities, and events. (5) Useful for establishing personal presence online. Both students enjoyed reading each other’s pages, as well as the comments on their own pages. Both appreciated how these revealed differences in points of view.</td>
<td>(1) Ease of creating/editing pages encourages use of website to brainstorm, plan, collect and organize information. (2) Ease of creating/editing pages encourages spontaneous, creative uses. (3) Ease of hyperlinking pages encourages creation of concept maps and webs. (4) Page access via alphabetical list, list of recently changed pages, site-wide keyword search. (5) Page creation and naming is ad hoc, requiring periodic creation of meta-organizer pages to aid conceptual organization and navigation. (6) Text-based software aids verbal learners, hinders visual learners.</td>
</tr>
<tr>
<td>Many-to-many; Synchronous interaction</td>
<td>Chat</td>
<td>(1) Difficult for discussants to be spontaneous without nonverbal cues. Replies typed and then deleted multiple times. (2) Long wait times between responses led to various affective and cognitive responses – anxiety, disinterest, impatience, use of the time to make notes, refer back to assigned readings, or plan facilitative responses.</td>
<td>(1) Convenience of meeting online from home a major advantage. (2) Difficult to organize and manage information; this problem was addressed by publishing chat summaries of the important points discussed each week. (3) Network difficulties sometimes interfered with transmission.</td>
</tr>
</tbody>
</table>
Flexible Responses to Diverse Learner Needs

The flexibility of the wiki-style website supported adaptations for evolving learner needs. The instructor’s primary goal was to provide a learning environment that encouraged self-awareness, questioning, and critical thinking skills. The instructor’s tasks included setting the learning outcomes and means of assessment, providing a framework and activities, helping students monitor their learning processes, and assisting them in achieving their own goals within the framework. Part of the effort to achieve these was providing scaffolds. The flexibility of the software allowed new scaffolds to be created as needed, such as in response to Ruth’s mid-semester request for more visual ways to understand the research process. The types of scaffolds included procedural/functional, process, conceptual, metacognitive, strategic, and interpersonal (see Chart 53).

Chart 53. Scaffolds to Guide Online Learning*

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Wiki Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Procedural/Functional</strong></td>
<td>Guidance on how to utilize instructional resources and tools</td>
<td>(1) Syllabus; (2) Module Map – tabular overview of how the goals of the course were addressed by modules and readings; (3) Course Assignments – tabular overview of how the goals of the course were addressed by course activities; (4) Weekly module format – readings, instructor discussion questions &amp; assignment, student discussion questions, chat summary</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>Guidance on helping learners understand their paths traveled within the learning experience</td>
<td>(1) Chat Summaries – weekly summaries of chat discussions provided on each respective module page &amp; cumulated on a single wiki page; (2) Module Questions – tabular summary of weekly discussion questions posed by students and instructor</td>
</tr>
<tr>
<td><strong>Conceptual</strong></td>
<td>Guidance on what to consider throughout the learning experience</td>
<td>(1) Research Models – graphic, tabular, &amp; metaphorical models of the research process; (2) Research Reports – outline &amp; questions to assist in writing the final report</td>
</tr>
<tr>
<td><strong>Metacognitive</strong></td>
<td>Guidance on how to think about the problems under study</td>
<td>(1) Project Planners – fill-in form to set goals &amp; objectives, chart benchmarks &amp; deadlines for research project; (2) Wiki page comments; (3) Self-assessment rubrics for final paper &amp; journal entries</td>
</tr>
<tr>
<td><strong>Strategic</strong></td>
<td>Guidance on approaches to solving problems</td>
<td>(1) Email exchanges; (2) Chat discussions; (3) FAQs</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td>Guidance for facilitating constructive collaboration and interpersonal interactions</td>
<td>(1) Communication tips; (2) Mentoring guidelines; (3) How to chat; (4) How to email</td>
</tr>
</tbody>
</table>

In addition, through email the instructor provided individualized responses to evolving learner needs by coaching and mentoring related to action research concepts and the planning and conducting of the research projects. Affective aspects and interpersonal strategies to motivate, guide, encourage, and support students were critical aspects of the mentoring.

**Creation and Invention**

As novices to collaborative software, the students found the wiki software easy to use. They created web pages for their weekly assignments and spontaneously created new pages to support their research projects. The ease of creating and editing pages encouraged the use of the website to brainstorm, plan, and collect and organize information. This also encouraged inventiveness, such as Sarah’s sample of coded data using various font styles and colors to indicate types of codes and memos. The ability to easily hyperlink pages encouraged the development of concept maps and site maps such as the scaffolds. Chart 54 lists the types of student-created wiki pages.

**Chart 54. Student-Created Wiki Pages**

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module Writings</strong></td>
<td>Answers to weekly questions posed by instructor (total of 14 pages per student)</td>
<td>Clarify thinking; share ideas &amp; receive feedback</td>
</tr>
<tr>
<td><strong>Research Proposal</strong></td>
<td>Drafts of research proposal (older drafts archived)</td>
<td>Share ideas &amp; receive feedback</td>
</tr>
<tr>
<td><strong>Brainstorming</strong></td>
<td>Early brainstorming about research project</td>
<td>Share ideas &amp; receive feedback</td>
</tr>
<tr>
<td><strong>Bibliography Page</strong></td>
<td>Record of resources reviewed for research project</td>
<td>Organize individual work; share ideas &amp; receive feedback</td>
</tr>
<tr>
<td><strong>Interview Questions</strong></td>
<td>Draft interview questions for research project</td>
<td>Share ideas &amp; receive feedback</td>
</tr>
<tr>
<td><strong>Literature Summaries</strong></td>
<td>Abstracts of literature reviewed for research project</td>
<td>Organize work; share ideas &amp; receive feedback</td>
</tr>
<tr>
<td><strong>Journal Entries</strong></td>
<td>Selected weekly journal entries</td>
<td>Document &amp; reflect on learning progress &amp; challenges; share ideas &amp; receive feedback</td>
</tr>
<tr>
<td><strong>Data Coding</strong></td>
<td>Sample coding of email data; Sarah used colored fonts to distinguish between different codes &amp; memos about coding.</td>
<td>Practice data analysis; share ideas &amp; receive feedback from instructor and peer</td>
</tr>
<tr>
<td><strong>Personal Home Page</strong></td>
<td>Home page of each participant</td>
<td>Organize &amp; index pages created</td>
</tr>
</tbody>
</table>
Building Relationships, Community, and Socially Constructed Knowledge

The use of private and public spaces fostered relationship building and community building. Interaction in the private space – one-to-one email – allowed dyads (mainly instructor-student) to address individual issues. This supported problem solving, co-reflection, coaching, mentoring, and relationship building.

Communication and interaction in the public spaces – wiki pages, chat sessions, and group email – supported co-reflection, problem solving, task completion, and community building. Student-created pages allowed each student to establish a unique online presence by presenting her work and sharing ideas. Both students enjoyed reading each other’s pages and appreciated how they revealed different points of view. Instructor-created pages presented a course philosophy, set the learning framework, and summarized the group’s learning paths. Chat sessions allowed for synchronous communication that helped maintain the rhythm and pace of the class and provided weekly opportunities to build a learning community. The chat summaries furthered student reflections on their learning progress, as noted in the example of Sarah’s end-of-semester review of all the chat summaries. Group email was useful for handling course business. Communication in the public spaces provided a persistent and easily accessible record of the evolution of the learning processes, the co-construction of knowledge, and community building (to the limited degree achieved in the course).

One of the instructor’s initial beliefs was confirmed by the evolution of the course – for novice users of collaborative software, the social resources for interaction and collaboration have greater impact on online learning than computer software functions. The fundamentals of such social resources have been discussed extensively throughout this paper. However, the use of online media increases the barriers to sociability when compared to face-to-face learning environments. The costs of achieving common ground in online communication can be considerable. The wiki software allowed participants the freedom to explore and create but also required discipline and effort to ensure conceptual clarity and orderliness in website presentation.
LEARNING OUTCOMES

This section addresses the learning outcomes component of the DIACOR Framework, as shown in Figure 23.

Figure 23. DIACOR Framework: Focus on Learning Outcomes

The DIACOR Framework targets three learning outcomes related to course objectives: transformational experience, transformed understanding, and higher self-efficacy. Viewing the learning process as a narrative requires that transformations in frames of reference be identified in order for the plot of a learning narrative to be recognized. All learning narratives therefore have transformational experience and transformed understanding as learning outcomes. It may be the case that no learning transformations can be identified and no learning narrative constructed; in this case, one can conclude that no learning occurred.

Self-efficacy is one of the most important tools for self-empowerment. Perceived self-efficacy influences motivation to set and achieve goals. These intentions set by the learner play an important role in learning, as Wells’ work on dialogic inquiry, Mezirow’s work on transformational learning theory, and recent work on intentional conceptual change demonstrate. Through intentional regulation of cognitive, metacognitive, meta-affective, and motivational processes, learners bring about changes in knowledge and frames of reference. They monitor and regulate their own learning through taking “meta” stances to problem solving through reflection.

Higher self-efficacy is an instructional goal; however, learning transformations may or may not result in higher perceived self-efficacy. Lower perceived self-efficacy, with attendant affective discomfort, may
be the impetus for a new cycle of learning in which the learner is highly motivated to change the state of affairs – the narrative situation – through intentional conceptual change.

Transformations in frames of reference and increased efficacy may occur at the individual or group level. Individual self-efficacy has been the focus of this study, and group or collective efficacy has only been cursorily examined. Bandura (1997: 477) defines collective efficacy as “a group’s shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments.” He discusses research related to collective efficacy in relation to organizational decision-making, political movements, and school staff, but not collective efficacy in classrooms or among small groups of learners. This remains a potentially fruitful area for future research.

The evidence indicates that the participants achieved these three learning outcomes in part through dyadic co-reflection. The following section provides a summation of the evidence.

**Transformational Experiences, Transformed Understandings**

In his transformational learning theory, Mezirow identifies four types of transformations – elaborating existing frames of reference, learning new frames of reference, transforming points of view, and transforming habits of mind. Transformations come through critical reflection on our assumptions and those of others and may occur gradually over time or may be sudden and dramatic (Mezirow, 2000). While points of view may be changed by “trying on another’s point of view, we are unable to do this with habits of mind. The most personally significant and emotionally exacting transformations involve a critique of previously unexamined premises regarding one’s self” (ibid., p. 21-22).

Transformations often involve reflecting on the meaning of one or more of the following: (1) a disorienting dilemma; (2) self-examination with feelings of fear, anger, guilt, or shame; (3) a critical assessment of assumptions; (4) recognition that one’s discontent and the process of transformation are shared; (5) exploration of options for new roles, relationships, and actions; (6) planning a course of action; (7) acquiring knowledge and skills for implementing one’s plans; (8) provisional trying of new roles; (9) building competence and self-confidence in new roles and relationships; and (10) a reintegration into one’s life on the basis of conditions dictated by one’s new perspective (ibid., p. 22).
The result of transformational experiences is transformed understanding. Transformative learning is empowering because it “involves liberating ourselves from reified forms of thought that are no longer dependable” (Mezirow, 2000: 27). Thus, “greater autonomy in thinking is a product of transformative learning – acquiring more of the understandings, skills, and dispositions of mind required to become more aware of the context of interpretations and beliefs, critically reflective of assumptions, able to participate freely and fully in rational discourse to find common meaning and validate beliefs, and effective in acting on the result of this reflective learning process” (ibid., p.29).

These patterns are clearly visible in the students’ self-reports about their transformative learning experiences in the three main areas addressed in the course: telementoring high school students for information literacy skills during the conduct of their senior research projects, learning and applying action research concepts and methods, and using the wiki for online learning and communication.

Ruth’s greatest transformational experience was related to her role as a teacher. She underwent “the most personally significant and emotionally exacting” transformation of changing a “habit of mind” about herself, by critiquing “previously unexamined premises” about herself as a learner. In her final paper, she directly addressed her process of self-change, the risks involved, and its great personal significance. As a result of this transformational learning experience, she achieved a more accurate understanding of herself as a teacher, a more open-minded and empathetic view of her former students, and a basis for more effective action in the future.

Regarding her telementoring of Jessica, Ruth was initially reluctant to use online media, a result of discomfort with online communication (and probably also the understandable preference for face-to-face communication when it was immediately available). As a result of a critical examination of her assumptions and a change in attitude, she was able to consider exploring options for new actions, such as using chat and other software programs.

Ruth’s description in her final paper of her changed view of action research is a concise and elegant description of her personal transformation and the “action” in action research:

Action research is exactly that. It is research that “moves.” What “moves” in action research is the researcher’s understanding of himself/herself. The understanding “moves” from limited insight to expanded outcomes, from frustration with not being able to change others to a focus on changing what you can – yourself. (5/14/04)
In the final interview, Ruth described how her view of research had changed during the course, from one of “library research” to a complex, constantly evolving process undertaken by self-aware, critically questioning researchers. In addition, in her final paper Ruth also described how her research project enabled her to change her negative view regarding online learning and to recognize that all learners need a variety of learning strategies to cope with the needs of diverse learning situations.

While Ruth seems to have transformed her view of herself dramatically through her work in the course, Sarah worked steadily at incremental changes in her understanding in the three main areas of telementoring her high school mentee, understanding and applying action research, and using the wiki for online communication and learning. Perhaps because of the incremental nature of her learning and her self-reported perfectionist tendencies, she almost seemed surprised at the significant understandings she had achieved by the end of the course.

Sarah’s most important learning sub-narrative was related to the identification of her roles as supportive listener, co-learner, teacher, and librarian in the telementoring project. During the early months of the project in the fall of 2003, she had not realized that a relationship with Corel was developing. Sarah believed strongly in the importance of relationship building and, at the beginning, was fearful that she would not be able to spark an emotional connection with Corel strong enough to motivate her telementee to continue the communication. Mezirow has noted that self-examination with feelings of fear is often the catalyst for a learning transformation. Through her analysis of the email data, she identified the supportive listener role through which she had transferred her interpersonal skills as a classroom teacher to the virtual environment. This enabled her to reach, in the online setting, her goals “to be a caring, nurturing, compassionate teacher who valued student input and the rapport between students and teacher; who provided the opportunities for student inquiry and encouraged students to take intellectual risks” (5/11/04). She stated in her final paper, “Possibly, my goals to be a caring, nurturing telementor were met” (5/11/04).

To meet the complex needs of the telementoring project, Sarah took three other roles – teacher, librarian, and co-learner – that she identified and examined in her final paper. From an earlier inability to see a relationship developing, Sarah became more discriminating about the relationship and more precise in
her ability to analyze it. She stated her intentions for future work on the research project, which included revising her focus, reorganizing her report, and revisiting her role as a librarian.

The process of analyzing the data also allowed Sarah to gain a realistic understanding of her abilities and her degree of mastery of the skills of librarianship, important aspects of an actionable sense of perceived self-efficacy: “As a librarian I realized that I am still learning and growing” (7/7/04). Her struggles as a student gave her a more realistic sense of what she could accomplish in her collaborations with teachers who are unfamiliar with information literacy skills. She planned to find novel ways of introducing information literacy without becoming repetitive.

Sarah provides other evidence that she made significant progress in understanding and applying action research. Her study evaluation was a masterful critical review that applied all her learning about the key concepts of action research. In addition, a book that the instructor had loaned to her at the beginning of the course had not made much sense to her at that time, but at the end of the course she noted, “when I was about to return the book to you, I happened to open it up again, and everything made perfect sense” (6/17/04).

Sarah also improved in her ability to use the wiki for learning and communication: “At first the wiki was tricky for me. It’s so easy [now]” (6/17/04).

The instructor/researcher also experienced transformational experiences and transformed understanding related to learning style differences, effective telementoring, reflection and co-reflection, and the differential learning of action research that affected course development, as detailed extensively throughout this paper. As instructor, I learned that the facilitation of the learning of action research is effectively supported by: (a) course design incorporating field-based, inquiry learning; (b) instructor understanding of learner backgrounds, frames of reference, learning styles, and types of reflection and co-reflection; (c) a learning philosophy that values constructivist learning, affect and relationship building in learning, the development of self-efficacy, and empowerment; (d) a combination of online and face-to-face facilitation and mentoring skills; and (e) simple, flexible software programs that allow co-learners to freely and easily create their own web pages and adapt to different communication and learning styles. As a researcher, I discovered the value of a narrative learning framework, rooted in current work in the cognitive
sciences, for conceptualizing and analyzing online learning through the use of story grammars for primary
learning narratives, reflection sub-narratives, and co-reflection sub-narratives.

**Higher Self-Efficacy**

Transformational experiences and transformed understandings led to higher self-efficacy for the course
participants in the three main areas: telementoring high school students for information literacy skills
during the conduct of their senior research projects, learning and applying action research concepts and
methods, and using the wiki for online learning and communication. To reiterate, self-efficacy is belief in
one’s capabilities to produce desired effects by one’s actions (Bandura, 1997: vii), and perceived self­
efficacy is a judgment of one’s ability to organize and execute given types of performances (ibid., p.21-22).

From an initial base of no experience with telementoring or mentoring high school students, Ruth
apparently developed a mutually satisfying relationship with her mentee, even to the extent that she felt
confident enough in herself to be a co-learner in the relationship. In her journal entry of March 6, Ruth
notes: “Although I am her mentor, I feel she’s taught me a lot more. She’s not only overcome personal
obstacles in her life, but also educational obstacles as well ... I need to learn from her, as I am often victim
of second guessing myself and my abilities. I need to stand up for myself, just as Jess does everyday. This
is just one of the lessons Jess has taught me.” From her final course comments, Ruth also showed more self
confidence in her abilities as an action researcher, finding herself able to question the findings of others
based on her own knowledge of the research process. At the end of the course, she stated that the wiki was
easy to learn and straightforward to use.

Sarah also reported a higher sense of self-efficacy in the three main areas. Regarding telementoring,
she stated, “As a teacher, I learned that I can build a relationship with a student in a virtual format”
(7/7/04). Her experiences learning about action research enhanced her perceived self-efficacy as a
classroom teacher: “It validated what I’ve been doing intuitively and informally. It gave me a positive
attitude about professional development. I just think it validated so many little things with my practice that
are important things” (6/17/04). Higher perceived self-efficacy regarding action research is evident in one
of her final course comments: “I now see teacher research as an important part of teaching. I feel capable
of doing teacher research” (7/7/04). By the end of the course, Sarah was confident in her abilities to use the wiki.

As an instructor, I believe I improved my abilities to facilitate and mentor the learning of action research online through the experience of dealing with different learning styles, types of reflection and co-reflection, and the constraints and possibilities of using simple, flexible software programs. As an instructor and researcher, I believe I have achieved higher self-efficacy in the use of a narrative learning framework for future use in instructional settings and research efforts.

CONCLUSION

In summary, the DIACOR Framework is a comprehensive framework for viewing the learning process as a unitary, multidimensional narrative aimed at learning transformations. The framework encompasses individual construction and social construction of knowledge. Four important features are: (1) learning narratives focused on transformations in frames of reference leading to higher self-efficacy related to the learning objectives; (2) co-reflection as a core activity; (3) an emphasis on the importance of affect and relationship building to support co-reflection; and (4) the learning facilitator as co-learner. This study demonstrates that the framework can be applied to learning in dyads and suggests that it can be extended to small group learning. The findings of this study suggest that whole group co-construction of knowledge does not necessarily occur by simply providing an opportunity for individuals to interact in learning settings. In order for this to occur, group co-construction of knowledge should be a learning objective, strategies for such co-construction should be designed into the learning framework, and learning assessments should recognize and value group co-construction of knowledge.

This chapter has discussed the major findings that address the revised research questions. First, the three key narratives of learning as a holistic process are: (a) the primary narrative of student learning in the action research course; (b) the reflection sub-narrative; and (c) the co-reflection sub-narrative. Second, co-reflection, an intersubjective, social process, is central to the co-construction of knowledge and involves: (1) sharing of experience and relevant information; (2) achievement of intersubjective understanding through collaborative meaning making; (3) synergy between co-reflection and relationship building based on respect, trust, sincerity, and concern; and (4) teacher as co-learner. Third, facilitation of the learning of
action research is effectively supported by: (a) course design incorporating field-based, inquiry learning; (b) instructor understanding of learner backgrounds, frames of reference, learning styles, and types of reflection and co-reflection; (c) a learning philosophy that values constructivist learning, affect and relationship building in learning, the development of self-efficacy, and empowerment; (d) online facilitation and mentoring skills; and (e) simple, flexible software programs that allow co-learners to freely and easily create their own web pages and adapt to different communication and learning styles.

Reflection and co-reflection are the key activities in collaborative meaning making and the co-construction of knowledge. While the important role of active co-reflection is clearly recognizable in intentional dialogue and interactive problem solving, it has been argued that a more tacit form of co-reflection also operates to achieve intersubjective understanding and knowledge co-construction. Tacit co-reflection involves not only verbal exchanges but also nonverbal interactions with affective dimensions. As evidenced by the manner in which the garden metaphor became a tool for collaborative meaning making for Ruth and the instructor, co-reflection through social interaction need not be strictly verbal. While it is true that metaphors are generally expressed through words, the deeply symbolic nature of metaphor extends beyond and obviates the need for complete verbal descriptions. Through these means, co-learners (students and instructors) undertake learning transformations.

The choice of what to respond to also conveys meaning nonverbally. Ruth and Sarah selected different readings and even different passages from the same readings to respond to in their weekly module assignments. Each choice conveyed differences in meaning to the instructor, who then responded differently to each student. Each subsequent response from participants extended and deepened the intersubjective understanding and produced a record of the evolution of socially constructed knowledge. Moreover, even silence (such as the example of participants not sharing their negative perceptions of the telementoring project) can be a means of creating intersubjective understanding. Thus, collaborative meaning making and knowledge co-construction through tacit or active co-reflection is an affective, cognitive, and social process.

Narrative analysis enables researchers as well as instructors to analyze small changes in narrative situation at the level of event, as well as larger changes in frames of reference at the levels of a sub-
narrative or primary narrative for an entire course. The benefit of narrative analysis is that, at each level, learning is seen as a plot – a unitary, multidimensional, dynamic phenomenon focused on changes in states of understanding. Affective, cognitive, interactional, and transformational dimensions are viewed as integrated and inseparable in the learning process.
CHAPTER 8. CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

The interdisciplinary nature of this study required explorations of theories, models, and practices in education, professional development, mentoring, and the use of technology for collaborative learning. This chapter discusses the study's contributions to research and practice and makes recommendations in three main areas: (1) the importance of co-reflection, (2) the use of narratives and narrative analysis, and (3) considerations for negotiating core tensions among human and technological factors in online learning.

IMPORTANCE OF CO-REFLECTION

Research Contributions and Further Research

Within the context of a narrative learning framework adapted from Gordon Wells' sociocultural theory of education, this study has identified co-reflection as an aspect of adult inquiry learning and provided evidence to indicate its value. Wells (2002) has suggested that the theory can be expanded from K-12 settings to teacher education by incorporating the idea of the teacher as researcher and inquirer. In support of these ideas, this study contributes a close examination of one of the mechanisms by which teacher inquiry can be accomplished: co-reflection. Co-reflection is the key element in a proposed dialogic inquiry and co-reflection framework that combines Wells' sociocultural theory with a model of reflection that incorporates affect (Boud et al., 1985a) and Mezirow's (2000) transformative learning theory.

I have defined co-reflection as a collaboratively undertaken reflective process, consisting of the intellectual and affective activities in which two or more individuals engage to explore their experiences in order to lead to new intersubjective understandings and appreciations. This clarifies that collaborative learning involves emotional awareness, responses, and management as well critical thinking skills. Co-reflection uses some or all of the seven key features of reflection and exhibits four interactional characteristics: (1) sharing of experience and relevant information; (2) achievement of intersubjective understanding through collaborative meaning making; (3) synergy between relationship building and co-reflection based on respect, trust, sincerity, and concern; and (4) teacher as co-learner (see Chapter 7, Figure 17).
Through co-reflection, individuals collaboratively assess their frames of reference and examine alternative perspectives to achieve a clearer understanding by drawing on collective experience. The affective dimension plays a key role, furthering the co-reflection process through emotional maturity as well as clear thinking. This study takes a broad meaning of the term “social interaction,” including both the co-construction of knowledge as a collaborative intellectual activity and the affective qualities and activities involved in relationship building, particularly where mentoring takes place. The result of these collaborative intellectual and affective interactions is new intersubjective understandings and appreciations.

Reflection has been widely recognized as important for critical thinking, but there is a range of views about what reflection encompasses. Different terms have been used for ideas similar to co-reflection. The terms “reflective dialogue” and “reflexive dialogue” are widely used in the professional development literature but largely in cases where the aim of the dialogue is for teacher educators or mentors to stimulate reflection among student teachers or new teacher inductees. When used in this way, these terms do not capture the collaborative nature of reflection and the reciprocity of teaching and learning among learning facilitators and students, or mentors and adult mentees. A third term, “dialogic reflection,” appears to better denote collaboration but as a process that takes place through dialogue. This study has shown that the aims of co-reflection – to achieve intersubjective meaning that leads to new understandings and appreciations – are attained not only through dialogue. For these reasons, co-reflection has been chosen to denote collaborative reflection accomplished through verbal and nonverbal means.

The term co-reflection is beginning to be used in work on reflection in education. In her work on mentoring new teachers, Diane Yendol Silva (1999, 2001) identifies co-reflection as one of the strategies mentor teachers use. Another example is Aalborg University’s research project, “Learning from Diversity - Conflict, Communication and Mathematics Education in the Multicultural Classroom.” One of the research methods used in the project is “co-reflection of analyses”35 in which the researchers state their intention to develop “internal co-reflection” among researchers, teachers, and students and “external co-reflection” with researchers in other cultural contexts.

35 http://www.lfd.learning.aau.dk/how.htm
This study also contributes to a better understanding of different types of reflection and co-reflection and their possible associations with different research paradigms (see Chapter 7, Chart 48). Though the findings are limited and tentative, based on only two students, the analyses of two significantly different learning experiences may provide useful insights for further research.

Because it was exploratory, this study suggests more questions than it answers. Much more research is needed on the phenomenon of co-reflection – by cognitive scientists as a mental behavior, by social psychologists as a group behavior, and by CSCL researchers as an online collaborative learning process, among others. This research could investigate such issues as the ontological relationship between individual reflection and co-reflection, whether tacit co-reflection is a vestige of co-reflection or an emerging form of it, and how types of co-reflection are related to building learning relationships. The tentative findings of this study that suggest the existence of tacit co-reflection should be further explored and developed.

Further research is also needed to confirm or disconfirm the tentative propositions underlying the typology of associated types of reflection, co-reflection, and preferences for research methods. The practical implication for learning facilitators is the need to be capable of co-reflecting appropriately with learners who use different styles of reflection and co-reflection.

The use of co-reflection among groups larger than dyads also remains a fruitful area for further research. This study has associated co-reflection with three learning outcomes: transformational experience, transformed understanding, and higher self-efficacy. Future research can investigate the process of co-reflection used by groups of individuals undertaking a joint activity to determine if and how transformational experience and transformed understanding occur at the group level and whether collective efficacy is a result. Peer coaching may play a significant role in learning in larger groups. This area of research would contribute to the current CSCL interest in investigating small group cognition (Stahl, forthcoming).

**Using Co-Reflection in Online Professional Development**

The findings of this study may be useful to guide, identify, and practice reflection and co-reflection in online professional development activities, such as online support for practicum courses, in-service
professional development, informal education programs, and activities of communities of practice. The reflection and co-reflection grammars used in this study may suggest ways in which other practitioners can adapt or develop their own learning narratives to facilitate and assess critical thinking skills in collaborative learning. I believe that one critical benefit of using these story grammars may be the incorporation of affect and relationship building in instructional design, implementation, and assessment.

Kreijns and Kirschner (2004: 221) make a distinction between social functionality and educational functionality in CSCL environments that confirms the importance of affect and relationship building in online learning. They also urge further research and development on the affective and social aspects of online learning:

In almost all cases, the sole variables under attention of educational researchers are those that deal with the design of educational functionality in CSCL environments. As a result, CSCL environments are designed that are predominantly functional, supporting all or a part of the cognitive processes for learning. However, learners only involved in cognitive processes and missing any possibility to escape from that, because the CSCL environment forces them to stick on these cognitive processes, will fail to develop trust, social cohesiveness, and a feeling of belonging to the group. In other words, these CSCL environments lack a social functionality. Learners in such groups will ultimately perform poorly. This observation is confirmed by a number of researchers from various disciplines.

The main conclusions and recommendations of this study related to the practice of co-reflection include the following, some of which confirm the advice of other practitioners (e.g., Paloff and Pratt, 1999, 2003; Preece, 2000; Wenger et al., 2002):

- Online professional development programs and activities should recognize the importance of the affective and interactional dimensions of learning. Stating the achievement of higher self-efficacy within the learning framework as an explicit learning objective is an effective means for recognizing this importance.

- Online professional development programs and activities should include co-reflection as the central activity, especially in the context of the study and application of reflective practice or action research.

- Reflection is an important part of learning and can be fostered through the use of journals. A variety of types of journals exist, such as personal journals, dialogue journals with the learning facilitator and/or another student, double-entry journals that connect personal experiences to formal class learning, critical incident journals using descriptive and evaluative accounts, and three-part journals that relate personal experience, course content, and impact on future practice.36

- Co-reflection is an important part of adult learning in particular and can be accomplished through learning facilitator-student mentoring, peer coaching, and small group learning via email, chat

36 These journaling techniques are described more fully at the website of the Northern Illinois University, Faculty Development and Instructional Design Center, “Importance of Reflection”; available at http://www3.niu.edu/facdev/teaching/srvlrn/reflection.htm; accessed January 20, 2005.
sessions, discussion boards, and collaborative workspaces. Paloff and Pratt (1999: 55-56) recommend small group sizes (5-10 participants) for synchronous communication, while noting that asynchronous communication can accommodate up to twenty participants.

- Co-reflection is fostered through the development of trusting relationships among co-learners. The development of such relationships should be part of the course design.

- Learning facilitators who view themselves and their students as co-learners in a learning community are better able to foster co-reflection and to take advantage of the knowledge and resources distributed throughout the community.

- In addition to the advantages of communicating at any time or place, one of the disadvantages is that online communication takes significantly more time and effort than face-to-face communication. This should be recognized and accommodated by learning facilitators, students, and administrators.

- Students who have barriers to online communication and learning should be supported in overcoming those barriers through interpersonal communication, the development of co-learner relationships, and various types of scaffolds.

- Identifying student learning styles may be beneficial, with a clear explanation of how this can benefit the student in his/her learning and in relationships with co-learners.

- Learning facilitators should accommodate different learning styles and be capable of communicating online using the “learning languages” of diverse learners.

Reflection and co-reflection are valuable not only for individual professional development but also for achieving larger educational reforms. Individual and small group changes are the means by which systemic reform are actualized, operating in much the same manner as Stahl’s (forthcoming) recent propositions about small group cognition as the engine of social and cultural knowledge construction. Many educational leaders, thinkers, and innovators past and present (e.g., Paulo Freire and conscientization, Ira Schor and empowering education, Michael Fullan and change forces, and Robert Evans’ cautionary notes on the human side of school change) have emphasized that system-wide reform only takes root through collaboration at the classroom and school levels where the particularities of context and individual differences are salient. Osterman and Kotkamp (1993) argue that top-down reform fails to create change because change begins with individuals. They believe that reflective practice has the greatest potential to create educational improvement because it places the individual teacher at the center of reform efforts. They provide an important caveat – that the means and ends of reflection cannot be formulaic or predetermined:

[P]recisely controlled and externally prescribed reform outcomes simply cannot be achieved through this process [of reflection]. We cannot mandate highly specific reform outcomes of the kinds that state
legislatures and departments of education have propounded in recent times. We cannot specify reflection as the means for introducing or changing a particular program, a particular curriculum, or a particular disciplinary procedure. We cannot reach an externally produced, preordained end through genuine reflective practice processes. Because reflective practice leads individuals to improve their own performance, the process ultimately enriches the organization's ability to achieve goals, but it is an unwritten assumption that through reflection many alternative and effective paths to the same goal will emerge. (ibid., p.187)

Virginia Richardson (1990) makes similar observations about teacher education. She argues that the failure of competency based teacher education (CBTE) in the 1970s and 1980s was due to the fact that knowing the proper behavior (competencies) was insufficient. Learning about teaching requires “judgment, experience, and a theoretical sense of the goals of education” (ibid., p.15). She promotes the value of reflection in teacher education, but provides a cautionary note against the technical rationalization of reflection as a measurable competency, which is inherently antithetical to its nature (ibid., p.13-14):

I see two threats to the development and implementation of reflective teacher education programs based on Schon or Dewey. The first is a process that seems to take place in education any time a major new idea catches on. This process leads to a "technologizing" of an idea or a program. Based on a positivist, linear conception of the educational and teacher education process, this process operationalizes an abstract value such as competency or reflection, into a behavior that is generalizable, observable, and teachable ... Missing from these programs are ... learning to think like a teacher ... The second threat to the development of reflection-in-action programs is the use of a positivist research paradigm with which to conduct research and evaluations around reflective teacher education programs. The kinds of questions asked at conferences focusing on reflective teaching are similar to those asked about CBTE: What is reflection? How can it be measured? Is a reflective teacher more effective than an unreflective teacher? What is the best way to develop reflective teachers? I am not suggesting that these questions are unimportant. They are, however, embedded within a positivist research approach and imply erroneously that answers to such questions through research will provide the form and substance of a reflective teacher education programs. What is needed, then, is a way of looking at the concept of reflection-in-action, at how teachers learn such reflection, and at programs designed to develop such learning that match the paradigm inherent in the concept.

If not as a generalizable, measurable behavior, how then can reflection and reflective practice be taught? Three alternatives are mentoring, peer coaching, and the use of co-reflection in more formal classroom environments. As many have noted (e.g., Levin, 2003; Robb, 2000; Tomlinson, 1995; York-Barr et al., 2001), in new teacher induction programs, in-service professional development programs, and informal professional development activities, the benefits are greatest from mentoring and peer coaching. Both utilize co-reflection (as described in this study) as a core activity. As this study has demonstrated, co-reflection can be successfully utilized in online courses where mentoring or coaching is an activity.
NARRATIVES AND NARRATIVE ANALYSIS

Research Contributions

This study contributes to the ongoing work on narrative cognition and narrative intelligence by providing rich descriptions of the use of narrative for self-scaffolding reflection and promoting dyadic co-reflection online. The reflection and co-reflection sub-narrative story grammars may be useful as an example to other researchers of how a voluminous corpus of data may be meaningfully reduced to essentials while retaining the closeness of such reductions to lived experience. Further research is needed on narrative as a tool for group cognition online.

This study also contributes to interdisciplinary CSCL research through demonstrating the use of narrative analysis as a research method to examine online learning that may contribute to other studies and future research of online learning. As discussed in Chapter 3, the discovery of narrative analysis came through a pressing need to adequately and accurately answer the original research questions using data that revealed student differences so significant as to make the use of grounded theory coding untenable. Other researchers may recognize similar research conditions that may benefit from the use of narrative analysis.

Narrative analysis is appropriate for qualitative research approaches aimed at induction, discovery, exploration, and theory building that use the researcher as the primary instrument for organizing and structuring the data collection. Narrative theory provides multidisciplinary perspectives and methods from diverse fields – ethnomethodology, literary analysis, history, sociology, social policy analysis, and cognitive sciences such as linguistics and artificial intelligence. As applied to studies in education, narrative analysis can be used flexibly – alone or in combination with other research methods from qualitative and quantitative traditions. The key issues, as always, are the purposes of the research and the specific research questions posed. This case study demonstrates how narrative analysis can be combined with a particular learning framework to yield discoveries about how and what adults learn as they experience a sophisticated type of inquiry learning (action research) in an online learning environment that emphasizes mentoring.

The use of narrative analysis may be fruitfully explored for researching other settings where inquiry learning and discovery learning principles operate. These may include informal professional development activities and building communities of practice, as well as secondary or undergraduate education. Narrative
analysis can be used to examine learning under conditions different from this study, such as larger class sizes or in face-to-face environments.

In whatever setting, the procedures used in this study may offer a guide for data collection and analysis. Relevant information about learner resources can be obtained through questionnaires, surveys, interviews, or a combination of these types of self-reports. It is important that the resources of the learning leader be included in the documentation. These resources include beliefs, assumptions, goals, functions, and tasks related to the learning experience, as well as conceptual, interpersonal, or technological tools used to implement the tasks.

During the learning process, activities, events, and learner responses should be documented. In online settings, these data are captured by the computer. In face-to-face settings, these can be documented through audio or video recordings or notes of observations by instructors and researchers. Apart from the instructional value of reflective writings by learners, such writings are important for identifying the affective, cognitive, interactive, and transformational dimensions of the learning process. These self-reports may take a variety of forms, the most common being journaling. What is critical is that learners are able to set their own learning goals within the instructional framework and to freely express the learning and discoveries that are most important to them as their learning proceeds. In addition to data related to learner outcomes that are obtained through regular assessment measures, obtaining self-reports from the learners at the end of the experience is also critical and can be done through interviews, surveys, questionnaires, journals, or other means.

The limitations of narrative analysis stem from its strength: the ability to focus on change and agency in unique individual or group learning cases. While the detailed findings of this study may not generalize to other settings, I believe that comparisons with other similarly detailed analyses of adult online inquiry learning will show the existence of “concrete universals” (Erickson, 1986). Although data collection in online settings is nearly effortless, data collection is more time-consuming when done in face-to-face settings. Data analysis is time consuming, and the interpretation of the results can be easily influenced by researcher subjectivity without measures to ensure validity and trustworthiness.
Educational Applications of a Narrative Learning Framework

I believe that practitioners can also benefit from the basic principles of using a narrative learning framework and narrative analysis to improve their practice. The primary and sub-narrative story grammars used in this study may suggest ways in which other practitioners may adapt or develop their own learning narratives to balance institutional or organizational learning goals with individual learner goals for intentional conceptual change, higher self-efficacy, and empowerment.

This study has shown that the use of a narrative learning framework encourages the valuing of co-learner resources and individual differences. This is supported by the work of other practitioners who have recognized the importance of individual differences in online learning (Paloff and Pratt, 2003) and online community building (Preece, 2000). Narrative learning models also build on the research being done on narrative as cognition. Narrative analysis as a pedagogical technique may assist learning facilitators and students in creating alternative assessments of learning, as demonstrated in this study through the use of primary narratives that focus on course learning outcomes and significant sub-narratives that focus on unique individual learning outcomes within the course framework.

The DIACOR Framework is a useful narrative structure to guide instructional design. It begins with the assumption that participants bring to the learning process a unique set of personal resources that include motivation and frames of reference in the form of experience, knowledge, understanding, and perceived affective, cognitive, and behavioral self-efficacy. It recognizes that the learning process is collaborative, multidimensional, holistic, and focused on transformation and increased self-efficacy. The DIACOR Framework was developed under the conditions of the action research course under discussion, namely: (1) constructivist, inquiry learning, and discovery learning environments (2) in which learners have a significant role in describing their learning experiences, (3) instructors view themselves as co-learners, and (4) the size of the learning group is small. The framework can presumably be best applied to other learning environments with similar conditions. In addition, if the framework is used in an online setting, (5) the activities are well supported by software such as wiki-style collaborative software. The framework may be particularly appropriate as a guide for online coaching or mentoring, collaborative learning by small groups.
in which learners jointly undertake a single project or task, and informal learning settings where standardized tests are not appropriate measures of learning outcomes.

In most instructional settings, the instructor takes the lead role in creating the learning environment. The instructor’s beliefs and assumptions provide the philosophical and instructional underpinnings for all activity. The learning goals set by the instructor determine the goal orientation of the learners, and the instructor’s functions and tasks determine how learning activities and assessment will be designed and implemented. The assumptions, goals, functions, and tasks of the learning facilitator in this case study are summarized in Chapter 7, “Co-Learner Resources.” Other settings in which the framework may be applicable are those that share some or all of these assumptions, goals, functions, and tasks.

As suggested by the mentoring functions of the learning facilitator in this study, the DIACOR Framework presumes a high degree of engagement and interaction. This suggests that it can best be used in small learning groups or communities. It may also be implemented in larger groups that are subdivided into smaller groups that practice co-reflection through peer coaching.

NEGOTIATING CORE TENSIONS

The complexity of learning under the conditions of this study (i.e., field-based, inquiry learning and mentoring involving a small number of students who wrote extensive reports about their learning) required the negotiation of some core tensions. The idea of essential tensions or core dualities, developed by Barab et al. (2002), refers to conflicting needs that drive a system and should be balanced rather than minimized. These core tensions occur along a continuum, and the choice of action is not seen as opting for one polar opposite over another but rather as balancing and making compromises to address competing needs within particular learning contexts. In implementing the action research course as instructor and in conducting the research about it, I faced a number of choices and tradeoffs throughout the process involving these core tensions: (1) learning subject matter or technology features; (2) using social resources or technology functions to support learning; (3) teaching as instruction or facilitation; (4) balancing co-learner differences; and (5) using face-to-face or online media for collaboration. Based on these experiences, the following sections discuss aspects of my decision making processes with the aim of providing
considerations and recommendations for others who wish to use a narrative learning framework for 
conducting or examining online inquiry learning.

**Learning Subject Matter or Technology Features**

Complexity creates challenges for both learners and instructors in several areas: (1) cognitive difficulty of 
the learning task; (2) diversity of individual differences of age, gender, learning style, and social, economic, 
and cultural backgrounds; (3) social complexity of the learner relationships in different group sizes; (4) 
sophistication of the software and communications technology; and (5) differences in online 
communication literacy and communication styles. In an online, collaborative learning context, all of these 
are mitigated and mediated by the software used to create the learning space.

Regarding the usability of software, Preece (2000) suggests that there are task hierarchies ranging 
from simple to difficult and that some tasks have alternative paths of varying complexity for achieving the 
same goal. Advanced technology increases the complexity of goal attainment. Combined with the learning 
challenges and social differences mentioned above, the task of learning in an online context can become 
overwhelming when users are faced with challenges caused by unnecessary technological complexity.
Olson and Olson (2000) recommend introducing advanced technologies in small steps, aligned with users’ 
readiness to accept and use these technologies.

Learning about action research is challenging, as both Ruth and Sarah noted. Learning how to use 
one online technology can also be challenging, particularly if the collaborative software provides many features 
and functions. Because Ruth and Sarah were novice users of collaborative software, I chose to use the 
simplest collaborative web software available to me. While it may be argued that more sophisticated 
software (e.g., with visual features for visual learners) would have better supported learning, I anticipated 
that none of the participants would have a high degree of online communication literacy. The results 
indicate that the simplicity of the software was well matched to the level of user skills. Under these 
conditions, I believe that advanced technology would have imposed an unnecessarily high learning curve 
with respect to the technology and detracted from efforts to achieve the course learning objectives. One of 
the key obstacles in learning new technology is the negative emotions and frustrations that can arise and 
lead to a decrease in perceived self-efficacy and avoidance of the technology. Using simple software
allowed Ruth and Sarah to gain a sense of accomplishment and an increase in perceived self-efficacy as each new skill was mastered.

Learning processes and interactions can be structured by human resources or software functionality. Achieving the proper balance is based on judgments about the strength of learner resources, the appropriateness of the software for the level of user skills, and the effort required to learn how to use the software compared to the effort needed to achieve the learning objectives.

This study recommends favoring simplicity and flexibility in the software. New software that features customization by the user is being developed for business and educational applications. Typically produced by large universities, free, open source courseware that allows customization by the instructor now includes a range of tools for communication and interactivity. Moodle,\textsuperscript{37} one of the most fully featured customizable courseware programs, includes discussion forums, internal email, real-time chat, whiteboards, real-time video, student personal home pages, and group spaces. Depending on user skills, the instructor can select from among these features as appropriate. Among business applications, JotSpot,\textsuperscript{38} called the first of a third generation of wikis,\textsuperscript{39} allows users to easily create customized web applications and install pre-built application templates.

Based on the principle that students should have the freedom to create their own web pages and applications, this study recommends the development of wiki-style software programs for educational uses that would allow students as well as instructors to easily and quickly (e.g., through selecting from drop-down menus) add web applications and templates to personal pages or group workspaces as needed. These applications could include lists and indexes of course contributions (e.g., discussion postings, assignments completed, journal or blog entries, and resources submitted), personal course organizers, blogs, bibliographies, annotated resources, and bookmarks. Group applications could include discussion forums, resource databases, collaborative documents and projects, notice boards, news pages, file sharing, and a shared calendar. Such freedom and flexibility could accommodate different learning goals and levels of user skills.

\textsuperscript{37} http://moodle.org
\textsuperscript{38} http://www.jotspot.com
\textsuperscript{39} A comment by Christopher Allen, programmer and technology watcher, on his blog, “Life with Alacrity,” http://www.lifewithalacrity.com
Using Social Resources or Technology Functions

While closely related to the cost of learning subject matter versus the cost of learning technology functions, this core tension focuses on the difference between using structured courseware such as WebCT and flexible social software such as wiki-style collaborative software. While courseware and social software can be equally sophisticated, courseware generally predetermines the learning paths and requires learners to adapt their learning and communication strategies to a static course presentation and set software functions, while social software supports group interactions by allowing users to more easily adapt the software to their learning and interpersonal strategies.

This study has demonstrated the value of social resources and the individual inventiveness that fueled creative uses of the software. It has also confirmed previous research that novice users tend to behave online in similar ways as they would face-to-face, transferring the fundamentals of social resources to online textual communication (Olson and Olson, 2000). Because the wiki-style software required little technical skill, the students found it easy to use and quickly achieved a sense of accomplishment from being able to create new pages and experiment with formatting. The flexibility of the software also allowed individuals to determine how they used cognitive, affective, and interpersonal skills online to achieve learning goals while accommodating different learning and communication styles. I argue that human creativity combined with other aspects of social resources enable users to adapt simple, flexible software to achieve learning tasks and collaborate, while software that offers many features and functions can inhibit all but the most sophisticated and technologically literate learners. Further research is needed on how collaborative software is used to support processes of group cognition and co-reflection in larger online classes than this study, and for building communities of practice around co-reflection.

The important principle to note is that the instructor and the students had equal freedom, though not the same responsibilities, to create new pages and edit previously created ones. The use of simple, flexible software places greater responsibilities on the learning facilitator to monitor and adapt the online learning space through the use of appropriate scaffolds. In larger groups, many of these tasks may be taken on by student facilitators in sub-groups with the guidance of the learning facilitator.
Teaching as Instruction or Facilitation

In this discussion, I consider the term, "instruction," in its limited sense as authoritative statements of what should be learned to achieve course objectives, while "facilitation" refers to encouraging and easing the process of the student achievement of self-determined learning objectives within the course framework. In other words, students pose their own driving questions to guide their intentions for conceptual change relevant to the course objectives. The core tension surrounding teaching as instruction or facilitation is influenced by class size, teaching philosophy, and student views of the role of instructors. In traditional classrooms with large class sizes, the role of the instructor tends to be as provider of information through lectures. In constructivist classrooms, while students have greater responsibility and agency for making learning discoveries, the role of the instructor includes providing relevant information within the learning framework. In the constructivist view of learning, one of the benefits of teaching as facilitation is that it encourages and supports learner empowerment.

The course examined in this study was different from traditional types of classrooms in important ways – there were only two students, who generally shared the instructor's constructivist learning philosophy and were mentored by the instructor. In contrast to Sarah, Ruth appeared to have expected a more traditional format (probably based on her previous experience with an online course that used courseware), because she mentioned that earlier in the course she had expected the information on the wiki to remain static. As instructor, I endeavored to anticipate the students' information needs and provide relevant information in a timely manner while encouraging them to make their own discoveries. I presented them with learning objectives and general criteria for judging whether these objectives were met.

As discussed extensively in Chapters 5 and 6, as the course progressed, it became clear to me that students were taking different learning paths. It was necessary to respond differently to each student, leading the two student-instructor dyads to take different collaborative learning paths. Similar to Sarah's discoveries in analyzing the data related to her telementoring of Corel, it was through analyzing and interpreting the action research course data that I realized how and why these paths were different in terms of types of reflection, co-reflection, action research methods, and transformations in frames of reference. I
believe that because they pursued their own inquiries with a high degree of motivation, both students successfully achieved the learning objectives I had set for the course.

Within the DIACOR Framework, the use of primary and sub-narrative story grammars helped me as a researcher to better understand the balance I had intuitively achieved as an instructor over the core tension between the attainment of course learning objectives and the freedom of will and agency of the individual students to manage the learning process to meet those objectives. While I had set the learning goals, the students actualized these in different ways. With each student, I negotiated (and sometimes struggled with) a different balance of instructional and facilitation activities and attitudes, largely influenced by differences in styles of learning, reflection, and co-reflection. The co-reflection narratives largely tell the story about how each student-instructor dyad negotiated this balance. Co-reflection operated to help each dyad achieve intersubjective meaning about the nature and importance of the learning goals and the activities needed to achieve them. Thus, individual learning transformations through co-reflection were the basis for collective understanding of action research.

For adult learners, the learning process is complex and varied. Inquiry learning, reflection, co-reflection, and action research promote critical thinking, intelligent choices, and self-empowerment. These activities provide opportunities for adult learners to fully exercise their strengths as learners and improve upon their weaknesses. My experiences of co-reflection with Ruth and Sarah strongly reinforced my view that the teachers of such learners are called on to balance the core tension over instruction versus facilitation through emphasizing facilitating rather than prescribing the learning outcomes.

**Balancing Co-Learner Differences**

Core tensions also exist related to co-learner differences (student-student and student-instructor), such as styles of learning, reflection, and co-reflection, as well as preferences for action research methods. As discussed previously, Ruth and Sarah were aware of the differences in their perspectives and learning styles. As instructor, I addressed their needs by providing more structure for Ruth and supporting Sarah’s need for more flexibility to pursue learning at her own pace. Because there were only two students, I was able to devote substantial effort to individualizing my responses through mentoring. With a larger class size, this would be extremely challenging to do to the same degree. With a large class, I would rely more on
peer coaching for co-reflection. As learning facilitator, I would co-reflect selectively with each student dyad or small group.

From Ruth and Sarah, I learned the importance of recognizing the diversity of approaches to reflection and action research. All types of reflection are useful and valuable. Mason (2001) notes that reflective practice generally begins with the technical goal of improving practice through behavioral change to attain specific practical goals, as determined by external authority. Starting at the technical level, the reflective practitioner or action researcher may move inward using psychological reflection, or outward using social/critical reflection. In instructional settings, I believe that the choice of movement should be the student’s. Individual students should be respected, valued, and accommodated “where they are” with respect to reflection skills and be encouraged to move to another level – inward or outward – that best suits their needs for growth. Students who are intrinsically motivated and hold intentions for conceptual change are most likely to achieve significant learning transformations and an increase in self-efficacy. Therefore, it is important to respect and value each learner’s personal resources, starting points, goals, motivations, and intentions for their own learning process within the instructional framework. The degree of the instructor’s attentiveness to student backgrounds and motivations is, again, heavily influenced by class size. I reiterate the recommendation of others that class size for online professional development activities should be small, and the preferred means of facilitating professional development is mentoring by master teachers or peer coaching.

**Using Face-to-Face or Online Media**

The costs of grounding in online communication related to Clark’s grounding theory have been discussed in Chapter 7. This section will briefly recapitulate the main points. The class met virtually fourteen times and face-to-face four times – for the introductory session, Module 4 on Insider Research, Module 8 on Validity Issues, and the concluding session. For Ruth, the costs of grounding in online communication were higher than for Sarah. This was probably due to the fact that there were few bases for common ground established at the beginning of the course for Ruth and the instructor, who were developing their relationship for the first time. At the end of the course, Ruth ranked face-to-face meetings (second) as more important for her learning than email (third) and far more important than chat (ninth). She also noted in her
final interview (6/12/04) that having face-to-face meetings was important because it was “easier to ask questions in person and gain immediate feedback.” In fact, two significant Ruth-instructor co-reflection events were based on discussions during face-to-face sessions.

Ruth also mentioned that having face-to-face meetings earlier in the course was beneficial. As instructor, I also felt that early face-to-face meetings with Ruth were valuable because I observed more openness in Ruth at these meetings. I believe that they helped us establish a trusting relationship that we were unable to do through online communication. Ruth’s email messages were generally concise and businesslike. She did not express her personality and emotions online as Sarah did. I concluded that this was due to her caution about writing online, inability to detect how her messages were received, and fear of being misinterpreted. The importance of early face-to-face meetings confirms the practice of a number of distance education programs. One example is the Library and Information Science Online Master’s Degree offered by the Graduate School of Library and Information Science at the University of Illinois at Urbana Champaign, which requires an on-campus meeting at the start of the program.

While Sarah appeared to be able to freely express herself and stated at the end of the course that she enjoyed learning virtually, she also stated that she felt “tired of the computer.” Both students were novice users of collaborative software, and neither was very experienced at online learning. If their experience with both increases in the future, it is likely that they will feel more comfortable, as well as increase their readiness for more advanced technology, such as the educational wiki technology recommended earlier in this chapter.

When face-to-face meetings are not possible and the available computer and telecommunications technology supports them, videoconferencing and audioconferencing are choices. Other options for larger class sizes are to pair or group novices with experienced technology users to help novices mitigate the costs of grounding, overcome their gaps in online communication literacy, and increase their self-efficacy with collaborative software.

CONCLUSION

The purpose of this study was to examine the co-construction of knowledge and how affect and interaction influence participant understanding of action research. Based on the findings, the original questions were
modified to include the narrative aspects of learning: (1) What are the key narratives of learning, and how do these narratives exhibit cognitive, affective, and interactional aspects? (2) How do student-instructor interactions influence student understanding in the action research course? (3) How do student-instructor interactions influence instructor understanding about how to effectively facilitate the learning of action research? The online workspace was created using wiki-style collaborative software, with added email and chat programs. Using these tools, the graduate students created a substantial body of online written artifacts describing their learning that provided rich data to answer the research questions.

Three key narratives were used to explicate learning as a holistic process: (a) the primary narrative focused on course learning objectives; (b) the reflection sub-narrative focused on unique learner outcomes within the course framework; and (c) the co-reflection sub-narrative focused on the co-construction of knowledge.

Reflection, an individual critical thinking process, played a key role in learning action research. Seven key features of reflection constituted the plot of the most significant individual learning narratives: (1) being confronted with a challenging question or situation, (2) dealing with feelings/emotions related to the challenge, (3) bringing experience into the thinking/reflecting process, (4) reframing perspective through bridging the concrete and the abstract, (5) making a leap of thinking, (6) integrating the new knowledge cognitively and affectively, (7) with implications for future action.

Co-reflection is an intersubjective, critical thinking process that involves: (1) sharing of experience and relevant information; (2) achievement of intersubjective understanding through collaborative meaning making; (3) synergy between co-reflection and relationship building based on respect, trust, sincerity, and concern; and (4) teacher as co-learner. While the value of active co-reflection is clearly recognizable in intentional dialogue and interactive problem solving, it has been argued that a more tacit form of co-reflection also operates to achieve intersubjective understanding and knowledge co-construction. Tacit co-reflection involves not only verbal exchanges but also nonverbal interactions, including affective activity.

Regardless of type, the evidence shows that co-reflection played a central role in the learning transformations of the students and the instructor. Co-reflection is mediated by language, broadly construed to include all meaningful signs. One example is the use of metaphor, which, while expressed verbally, can
extend intersubjective understanding beyond explicit verbal description and cognitive processes to connote cultural symbols and affective dimensions. The different co-reflection narratives described in this study provide detailed records of the evolution of socially constructed knowledge and collaborative meaning making with affective, cognitive, and interactional dimensions. It is proposed that co-reflection is a core activity in the processes of group cognition. As an emerging concept, co-reflection provides fertile ground for further investigation. It is also proposed that types of reflection may be associated with types of co-reflection, epistemological stances, and research approaches. Further research in both face-to-face and online contexts is needed to investigate the components and associations represented in the typology.

The pedagogical framework used to design the course was adapted from Gordon Wells' (1999) dialogic inquiry process: individuals use experience, knowledge, and information to co-construct knowledge and create, use, and improve representational artifacts. Based on the findings, this was revised as a narrative framework – the Dialogic Inquiry & Co-Reflection Framework – to represent the holistic, multidimensional nature of learning as a dynamic process. The framework features: (1) a learning narrative focused on transformations in frames of reference leading to higher self-efficacy related to the learning objectives; (2) co-reflection as a core activity; (3) a recognition of the importance of affect and relationship building in supporting co-reflection; and (4) the learning facilitator as co-learner. Because there were only two students in this study, further research is needed to shed light on the applicability of the framework for other students, larger groups, and different learning environments.

The findings of this study indicate that online learning of action research is effectively supported by: (1) field-based, inquiry learning; (2) instructor understanding of the learners' backgrounds, frames of reference, learning styles, and types of reflection and co-reflection; (3) a learning philosophy that values constructivist learning, affect and relationship building, the development of self-efficacy, and empowerment; (4) online facilitation and mentoring skills; and (5) social software. The combination of simple, flexible software tools used in the course effectively supported complex learning processes by allowing novice users to focus their learning efforts on course content rather than software features, and to adapt and augment learning and communication strategies from their face-to-face experiences. Such strategies include skills in critical thinking, co-reflection, motivational support, and relationship building.
as well as facilitative strategies for ensuring that learning is a whole-person activity with the ultimate goal of learning transformations and empowerment.

Conducting the research and implementing the course involved the negotiation of choices involving five core tensions: (1) learning subject matter or technology features; (2) using social resources or technology functions to support learning; (3) teaching as instruction or facilitation; (4) balancing co-learner differences; and (5) using face-to-face or online media for collaboration. The study recommends the development and use of social software to support learning, based on the argument that human creativity and other social resources enable co-learners (students and learning facilitators) to adapt simple, flexible software to achieve learning tasks and collaborations. The study emphasizes that adult inquiry learning calls for favoring facilitating rather than prescribing the learning outcomes. The study also recognizes the importance of respecting and developing a diversity of approaches to reflection and action research. Finally, to mitigate the costs to sociability inherent in online media, the study recommends small class sizes for online professional development activities, face-to-face meetings where possible, and telementoring or peer coaching.

Narrative analysis was used to interpret the data for three reasons: (1) the narrative is a basic form for making meaning from human experience; (2) the individual learners were unique in background, learning style, and goals; and (3) the flexibility and ease of use of the social software encouraged users to adapt and innovate. Learning is itself a narrative focusing on changes in frames of reference. Both students used narrative as a conceptual artifact to scaffold their learning – Ruth in the form of extended metaphors and Sarah as concrete stories from her past. Stories were both individually and socially constructivist. Though the students were exposed to the same course content, presentation, and assignments, they used these resources in markedly different ways. Because of the complexities of socially constructed knowledge, other analysis methods failed to reveal significant discovery processes driving knowledge construction. The focus on human action and agency afforded by narrative analysis provided a means to apprehend and interpret these richly different learning experiences. The simple software tools provided a record of the evolution of socially constructed knowledge. Narrative analysis offered a theoretical framework for elucidating the processes underlying that evolution. This work suggests that evaluations of learning in
which students have a significant role in creating written artifacts of their experiences can benefit from the use of narrative analysis.
APPENDIX A

CONSENT FORM FOR MENTORS (GRADUATE STUDENTS)

Agreement to Participate In:

Telementoring for Information Literacy:
A Study of Inquiry Learning Through Online Communication

Section I: Principal Investigator

Principal Investigator: Joyce Yukawa
LIS Program, UHM
2550 The Mall
Honolulu, HI 96822
Phone: (808) 956-5838

Section II: Program Description

You are invited to participate in a study of telementoring for information literacy. The purpose of this study is to examine the language of inquiry learning done through online communication, in order to contribute to a better understanding of how technology facilitates, changes, or inhibits children’s processes of inquiry and motivation to learn. An important aspect of this investigation is bringing to the foreground the role of the affective dimension. The study will focus on telementoring relationships between graduate students in the UH LIS School Library Media Specialist Certification program and high school students in a public school in Oahu.

If you decide to participate, I will need to monitor your online communication with the selected high school students, as well as interview you four times during the course of the telementoring program. I may also observe a telementoring interaction involving you and the student. You may decline at any time to answer questions asked during the course of research. The focus of the interviews will be on discussing the types of speech acts and conversations you had with the student, in order to better understand the nature and functions of these exchanges. These sessions will be audio tape recorded for the purposes of research in order to better understand the thoughts, feelings, and actions during particular telementoring conversations. The tapes will be secured for the duration of the research project and destroyed upon completion of the project.

You will have the opportunity to see and comment on all transcripts, interview notes, and notes from field observations. After I have revised the study report based on participant comments, you will have the opportunity to see and comment on the final report.

The duration of program will be the academic school year 2003-2004.

Any information that is obtained in connection with this study and can be identified with you will remain confidential and will be disclosed only with your permission. Before any information is collected, you will be asked to select an alias to be used to represent yourself during this study. This name will afford you complete confidentiality during this study.

Participants in this study will receive a copy of the final report. Mentors should benefit from experience putting principles of teaching information literacy into practice, experience with telementoring and online
communication tools and methods, and participation in action research. Broader contributions of the study include a better understanding of the process of establishing and maintaining mentoring relationships online.

Your decision whether or not to participate in this study will not affect your future relations with the University of Hawai'i, the Hawai'i Dept. of Education, or me. If you decide to participate, you are free to discontinue participation at any time. Simply contact me, and you will be removed from the study.

You are making a decision whether or not to participate. Your signature indicates you have read the information provided above and have decided to participate. You may withdraw at any time after signing this form, should you wish to discontinue participation. Simply contact me, and you will be removed from the study. There is no foreseeable risk involved with participating in this study. You will receive a copy of this consent form and this explanation about the nature of your participation and the handling of the information you supply.

If you have any questions, please ask me. If you have any questions later, please feel free to contact me at any time. I can be reached by email at: yukawa@hawaii.edu. You can also reach my academic supervisor at, Dr. Violet H. Harada, at: vharada@hawaii.edu.

**Section III: Certification**

I certify that I have read the above, that I have been given satisfactory answers to my inquiries concerning program procedures and other matters, and that I have been advised that I am free to withdraw my consent and to discontinue participation in the program or activity at any time without prejudice.

I herewith give my consent to participate in this program with the understanding that such consent does not waive any of my legal rights; nor does it release the principal investigator or the institution or any employee or agent thereof from liability for negligence.

**Section IV: Signature**

Signature of participant: __________________________________________

Date: __________________________

If you cannot obtain satisfactory answers to your questions, or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawai'i, 2540 Maile Way, Honolulu, HI 96822; Phone (808) 956-5007.

cc: Participant
APPENDIX B

CONSENT FORM FOR SCHOOL LIBRARY MEDIA SPECIALIST

Agreement to Participate In:

Telementoring for Information Literacy:
A Study of Inquiry Learning Through Online Communication

Section I: Principal Investigator

Principal Investigator: Joyce Yukawa
LIS Program, UHM
2550 The Mall
Honolulu, HI 96822
Phone: (808) 956-5838

Section II: Program Description

You are invited to participate in a study of telementoring for information literacy. The purpose of this study is to examine the language of inquiry learning done through online communication, in order to contribute to a better understanding of how technology facilitates, changes, or inhibits children’s processes of inquiry and motivation to learn. An important aspect of this investigation is bringing to the foreground the role of the affective dimension. The study will focus on telementoring relationships between graduate students in the UH LIS School Library Media Specialist Certification program and high school students in a public school in Oahu.

If you decide to participate, I will need to interview you once at the beginning of the study, once a month throughout the duration of the telementoring program, and once after the completion of the program. I may also observe interactions involving you and the students. You may decline at any time to answer questions asked during the course of research. The focus of the interviews will be on discussing the students’ progress in their projects, the role of telementoring in their progress, problems in the telementoring relationships, and needed changes in the project. These sessions will be audio tape recorded for the purposes of research in order to better understand the thoughts, feelings, and actions during particular telementoring conversations. The tapes will be secured for the duration of the research project and destroyed upon completion of the project.

You will have the opportunity to see and comment on all transcripts, interview notes, and notes from observations. After I have revised the study report based on participant comments, you will have the opportunity to see and comment on the final report.

The duration of program will be the academic school year 2003-2004.

Any information that is obtained in connection with this study and can be identified with you will remain confidential and will be disclosed only with your permission. Before any information is collected, you will be asked to select an alias to be used to represent yourself during this study. This name will afford you complete confidentiality during this study.

Participants in this study will receive a copy of the final report. The school library media specialist should benefit from this study by gaining online curriculum materials and tools that integrate information literacy skills, experience with online communication tools and methods, evidence of student learning measured against standards-based criteria, experience with curriculum innovation through designing and facilitating...
telementoring, and participation in action research for curriculum design. Broader contributions of the study include a better understanding of the process of establishing and maintaining mentoring relationships online.

Your decision whether or not to participate in this study will not affect your future relations with the University of Hawai‘i, the Hawai‘i Dept. of Education, or me. If you decide to participate, you are free to discontinue participation at any time. Simply contact me, and you will be removed from the study.

You are making a decision whether or not to participate. Your signature indicates you have read the information provided above and have decided to participate. You may withdraw at any time after signing this form, should you wish to discontinue participation. Simply contact me, and you will be removed from the study. There is no foreseeable risk involved with participating in this study. You will receive a copy of this consent form and this explanation about the nature of your participation and the handling of the information you supply.

If you have any questions, please ask me. If you have any questions later, please feel free to contact me at any time. I can be reached by email at: yukawa@hawaii.edu. You can also reach my academic supervisor at, Dr. Violet H. Harada, at: vharada@hawaii.edu.

Section III: Certification

I certify that I have read the above, that I have been given satisfactory answers to my inquiries concerning program procedures and other matters, and that I have been advised that I am free to withdraw my consent and to discontinue participation in the program or activity at any time without prejudice.

I herewith give my consent to participate in this program with the understanding that such consent does not waive any of my legal rights; nor does it release the principal investigator or the institution or any employee or agent thereof from liability for negligence.

Section IV: Signature

Signature of participant: ________________________________

Date: ________________________________

If you cannot obtain satisfactory answers to your questions, or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawai‘i, 2540 Maile Way, Honolulu, HI 96822; Phone (808) 956-5007.

cc: Participant
APPENDIX C

CONSENT FORM FOR PARENTS

Agreement to Participate In:
Telementoring for Information Literacy:
A Study of Inquiry Learning Through Online Communication

Section I: Principal Investigator (Researcher)

Principal Investigator (Researcher): Joyce Yukawa
Library and Information Science (LIS) Program, UHM
2550 The Mall
Honolulu, HI 96822
Phone: (808) 956-5838

Section II: Program Description

Your child is invited to be part of a study that looks at how online communication (e.g., email and chat) is used when students are guided through the information search and research process by mentors who cannot be with them face-to-face (telementoring). The purpose is to better understand how technology affects children’s learning and motivation to learn. Each high school student in the study will be matched with a UH graduate student in the Library and Information Science Program (LIS). In order to protect the privacy of the relationships, the email and chat will be located on a website that only the participants of the study can enter.

If you decide to allow your child to participate, I will need to monitor his/her online communication with the LIS graduate student who is his/her mentor. I will also interview him/her four times to discuss the conversations your child had with his/her mentor. Your child may refuse at any time to answer my questions. I will also ask him/her to keep a learning journal. I may also observe face-to-face meetings between your child and the adults participating in the program. These sessions will be audio tape recorded. I will be the only person with access to these tapes during the project, and I will destroy them when the project is finished.

You will be able to see and comment on all transcripts, interview notes, and notes from observations. After I have revised the study report based on participant comments, you will be able to see and comment on the final report.

The duration of program will be the academic school year 2003-2004.

Any information that can be identified with your child will remain confidential and will be disclosed only with your permission. Before any information is collected, your child will be asked to select an alias to represent himself/herself during this study. This name will allow your child complete confidentiality during this study.

Participants in this study will receive a copy of the final report. By participating in this program, students should gain better information search skills, experience with telementoring and online communication, and better motivation for inquiry learning. I hope the study will also provide a better understanding of how online mentoring relationships are developed.
Your decision whether or not to allow your child to participate in this study will not affect your future relations with the University of Hawai‘i, the Hawai‘i Dept. of Education, or me. If you decide to allow your child to participate, you or your child are free to stop participating at any time. Simply contact me, and your child will be removed from the study.

You are making a decision whether or not to allow your child to participate. Your signature indicates you and your child have read the information provided above and have decided to participate. You may withdraw your child at any time after signing this. Simply contact me, and your child will be removed from the study. There is no foreseeable risk involved with participating in this study. You will receive a copy of this consent form and this explanation about the nature of your child’s participation and the handling of the information obtained for the study.

If you have any questions, please ask me. If you have any questions later, please feel free to contact me at any time. I can be reached by email at: yukawa@hawaii.edu. You can also reach my academic supervisor at, Dr. Violet H. Harada, at: vharada@hawaii.edu.

Section III: Certification

I certify that I have read the above, that I have been given satisfactory answers to my questions concerning program procedures and other matters, and that I have been advised that I am free to withdraw my consent and to stop my child’s participation in the program or activity at any time without prejudice.

I consent to the participation of my minor child / minor ward in this program with the understanding that such consent does not waive any of my child’s legal rights; nor does it release the principal investigator or the institution or any employee or agent thereof from liability for negligence.

Section IV: Signature

Signature of parent/guardian: 

Date: 

If you cannot obtain satisfactory answers to your questions, or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawai‘i, 2540 Maile Way, Honolulu, HI 96822; Phone (808) 956-5007.

cc: Participant / Parent
APPENDIX D

ASSENT FORM FOR HIGH SCHOOL STUDENTS

Agreement to Participate In:

Telementoring for Information Literacy:

A Study of Inquiry Learning Through Online Communication

Section I: Principal Investigator (Researcher)

Principal Investigator (Researcher): Joyce Yukawa
Library and Information Science (LIS) Program, UHM
2550 The Mall
Honolulu, HI 96822
Phone: (808) 956-5838

Section II: Program Description

I would like to invite you to be part of a study that looks at how online communication (e.g., email and chat) is used when students are guided through the research process by mentors who cannot be with them face-to-face (telementoring). Each high school student in the study will be matched with a UH graduate student in the Library and Information Science Program (LIS). In order to protect the privacy of the relationships, the email and chat will be located on a website that only the participants of the study can enter.

If you decide to participate, I will need to monitor your online communication with the LIS graduate student who is your mentor. I will also interview you four times to discuss the conversations you had with your mentor. You may refuse at any time to answer my questions. I will also ask you to keep a learning journal. I may also observe face-to-face meetings between you and your mentor or the school librarian. These sessions will be audio tape recorded. I will be the only person with access to these tapes during the project, and I will destroy them when the project is finished.

You will be able to see and comment on all transcripts, interview notes, and notes from observations. After I have revised the study report based on your comments and those of others, you will be able to see and comment on the final report.

The duration of program will be the academic school year 2003-2004.

Any information that can be identified with you will remain confidential and will be disclosed only with your permission. You will be asked to select an alias for this study. This name will give you complete confidentiality during this study.

You will receive a copy of the final report. By being part of this program, I hope you will improve your research skills, enjoy your experience communicating online with your mentor, and be motivated to continue your research. I hope the study will also give others a better understanding of how online mentoring relationships are developed.

Your decision whether or not to participate in this study will not affect your future relations with the University of Hawai‘i, the Hawai‘i Dept. of Education, or me. If you decide to participate, you can stop at any time in the future. Simply contact me, and you will no longer be part of the study.
You are making a decision whether or not to participate. Your signature indicates you have read this information and have decided to participate. You may withdraw at any time after signing this form. Simply contact me, and you will be removed from the study. There is no foreseeable risk involved with participating in this study. You will receive a copy of this consent form and this explanation about the nature of your participation and the handling of the information you supply.

If you have any questions, please ask me. If you have any questions later, please feel free to contact me at any time. I can be reached by email at: yukawa@hawaii.edu. You can also reach my academic supervisor at, Dr. Violet H. Harada, at: vharada@hawaii.edu.

Section III: Certification

I certify that I have read the above, that I have been given satisfactory answers to my questions concerning program procedures and other matters, and that I have been advised that I am free to withdraw my consent and to stop participating in the program or activity at any time without prejudice.

I give my consent to participate in this program with the understanding that such consent does not waive any of my legal rights.

Section IV: Signature

Signature of participant: ____________________________

Date: ____________________________

If you cannot obtain satisfactory answers to your questions, or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawai‘i, 2540 Maile Way, Honolulu, HI 96822; Phone (808) 956-5007.

cc: Participant
APPENDIX E

QUESTION GUIDE FOR PRE-COURSE INTERVIEW WITH GRADUATE STUDENTS

Part I. Technical Expertise

What experience have you had with the following?

- Internet
- Email
- Chat groups
- Newsgroups
- WWW browsing
- Search Engines and Subject Directories
- Academic Research
- Multimedia presentations
- Desktop publishing
- Install and delete software
- Troubleshooting software conflicts
- Word processing
- Spreadsheet applications
- Database building
- Computer aided designs (technical drawings)

Part II. Previous Mentoring Experiences and Expectations of Telementoring

- Do you recall ever having a mentor?
- What was your most significant mentoring relationship?
- Where and when did you meet this person?
- What did you do together?
- How long did this continue?
- What would you say set this relationship apart from others you’ve had?
- What about this relationship was most beneficial and enjoyable?
- What was difficult or frustrating about it?
- What lasting effects do you think the relationship has had on you?
- How do you expect your student’s experience of telementoring to differ from your own experiences of mentoring face-to-face?
- What limitations do you think might be involved in telementoring, in comparison to traditional mentoring?
- How do you think you will convey to your student what telementoring can or should be like?
- What personal experiences can you draw on to do this?
- What are you hoping your student will get out of telementoring in relation to their project?

Part III. Teaching Philosophy and Practice

- How would you describe your teaching philosophy?
- Do you incorporate open-ended inquiry techniques in your teaching? If yes, can you give some examples?
- What do you think are the benefits of inquiry-based learning? The difficulties and challenges?

• What experience have you had with project-based learning?
• What do you think are the advantages and disadvantages of project-based learning?
• Have you had experience teaching information literacy skills? If yes, please describe this.
• What kinds of information literacy skills do you think students need to know, if any? Why are these important?

Part IV. Personal Data

• Highest degree earned
• Degree specialization
• Years teaching / grade level(s) / discipline
• Years online
APPENDIX F

QUESTION GUIDE FOR INTERVIEW WITH HIGH SCHOOL STUDENTS

Part 1. Technical Expertise

What experience have you had with the following?

- Internet
- Email
- Chat groups
- Newsgroups
- WWW browsing
- Search Engines and Subject Directories
- Academic Research
- Multimedia presentations
- Desktop publishing
- Install and delete software
- Troubleshooting software conflicts
- Word processing
- Spreadsheet applications
- Database building
- Computer aided designs (technical drawings)

Part 2. Previous Mentoring Experiences and Expectations of Telementoring

- Do you recall ever having a mentor?
- What was your most significant mentoring relationship?
- Where and when did you meet this person?
- What did you do together?
- How long did this continue?
- What would you say set this relationship apart from others you’ve had?
- What about this relationship was most beneficial and enjoyable?
- What was difficult or frustrating about it?
- What lasting effects do you think the relationship has had on you?
- How do you expect telementoring to differ from your own experiences of mentoring face-to-face?
- What are you hoping to get out of telementoring in relation to your project?

Part 3. Personal Data

- Age
- Grade level
- Years online

---

APPENDIX G

QUESTIONNAIRE FOR POST-COURSE INTERVIEWS OF GRADUATE STUDENTS

LIS 699 Spring 2004 – Final Comments June 2004

Course Components

Rank the following in order of importance to you for your learning progress this semester:

___ Telementoring your mentee
___ Weekly assigned readings
___ Independent readings for your research project
___ Writing your weekly module assignments
___ Journals
___ Chat
___ Email with instructor
___ Research project
___ Face to face meetings
___ Other

Add your comments, if any, on the role the following played in your learning.

• Telementoring your mentee
• Weekly readings
• Independent readings for your research project
• Writing your weekly module assignments
• Journals
• Chat discussions
• Email with instructor
• Research project
• Face to face meetings
• Other:

Course Modules

Look at the list of modules. In which modules did you feel you made the best progress in learning this semester? Please describe why you chose each module to answer this question.

(1)
(2)
(3)

In which modules did you feel you made the least progress in learning this semester? Please describe why you chose each module to answer this question.

(1)
Other comments on the modules:

Course Readings

Look at the list of course readings [http://128.171.58.204/tm1/?page=CourseReadings]. Consider only those you read (some were not assigned) and answer the questions. Use the blue numbers on the page to select the readings.

Which readings were the most meaningful to you? Why?
(1)  
(2)  
(3)  

Which readings were the most difficult to understand? If you can, indicate what was difficult.
(1)  
(2)  
(3)  

Which readings “resonated” best with your own experiences and understanding? Why?
(1)  
(2)  
(3)  

Which readings were the least helpful to you? Why?
(1)  
(2)  
(3)  

Other comments on the readings:

What You Learned

What is the single most important thing you learned this semester?

Please list your top “aha’s” this semester:
(1)  
(2)  
(3)  
(4)  
(5)
Did your experiences this semester change the way you see yourself? If yes, in what ways? What, if anything, did you learn about yourself that you didn’t know before?

Did your experiences this semester change the way you see or look at the “world”? If yes, in what ways?

Other comments on what you learned:

**Online Communication**

How did using online communication benefit you the most?

How did using online communication benefit you the least? What aspects of using online communication do you think hindered your learning? How did you cope with these?

Other comments on online communication:

**Wiki**

Was the wiki easy for you to use? Why or why not?

*Course Organizer pages:*

Please rank the following in order of usefulness to you. Cross out any pages you did not view.

- Course Syllabus
- Course Readings
- Research Models
- Module Map
- Course Assignments
- Evaluation Rubrics
- Research Reports
- Project Planners
- Module Questions
- Chat Summaries
- Formatting Rules

*Other Resources pages:*

Please rank the following in order of usefulness to you. Cross out any pages you did not view.

- Online Action Research Courses
- Methodology Readings
- Teacher Writings
- Action Research Networks
Instructor

What things did the instructor do that were most helpful to your learning?

What things did the instructor do that were least helpful to your learning?

What could the instructor have done to help you learn better?

Other comments on the instructor:
APPENDIX H

COURSE SYLLABUS

Course Philosophy

This is an opportunity for all of us to explore what it means to be simultaneously an inquirer, researcher, and practitioner. The best metaphor is to "take a journey." Each of us will take a unique individual journey this semester, and we'll also all journey together. General expectations are outlined below; however, the most important thing is that the next few months gives us opportunities to engage in our own work and reflection, examine our values and practices as professionals, imagine and investigate better ways of doing things, and perhaps undergo some transformations. As such, this cannot be mapped out in advance. We will have to feel our way through.

Purpose

To explore action research as a method of self-reflective practice and apply this approach to telementoring experiences.

Objectives

1. Define action research.
2. Understand yourself as a professional by exploring your telementoring and other experiences as a teacher.
3. Identify research questions related to telementoring.
4. Describe methodologies that can be used in action research.
5. Describe data collection, analysis, and interpretation methods used in action research.
6. Understand and apply ethical guidelines for action research.

Activities

Students are required to:

1. Communicate regularly with their student mentees and support and guide them through completion of their senior research projects.
2. Attend LIS 699 face-to-face and virtual sessions (number and time to be determined).
3. Communicate online related to LIS 699 learning, using wiki email and by creating and editing wiki pages.
4. Complete a student portfolio.

Product

Student portfolio consisting of:

1. Weekly telementoring journals (includes reflections on TM experiences as mentor and explorations of action research by teacher as researcher; see self-assessment criteria below)
2. Proposal for a mini-research study related to telementoring (see ActionResearchProposal)
3. Report of a mini-research study related to telementoring (see assessment criteria below)
### Matrix of Objectives, Activities, and Products

Note: C = Chat or Class, E = Email, J = Journal, WP = Wiki Pages

<table>
<thead>
<tr>
<th>Objective</th>
<th>Activities to Achieve Objective</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define action research.</td>
<td>Readings, Module work, C</td>
<td>Research Report</td>
</tr>
<tr>
<td>Understand yourself as a professional by exploring your telemonitoring and other experiences as a teacher.</td>
<td>Readings, Module work, C, E, J, WP</td>
<td>Journals, Research Report</td>
</tr>
<tr>
<td>Identify research questions related to telemonitoring.</td>
<td>Readings, Module work, C, E, J, WP</td>
<td>Research Proposal &amp; Report</td>
</tr>
<tr>
<td>Describe methodologies that can be used in action research.</td>
<td>Readings, Module work, C, E, J, WP</td>
<td>Research Proposal &amp; Report</td>
</tr>
<tr>
<td>Describe data collection, analysis, and interpretation methods used in action research.</td>
<td>Readings, Module work, C, E, J, WP</td>
<td>Research Proposal &amp; Report</td>
</tr>
</tbody>
</table>

#### Evaluation Method

**Rubric for joint assessment of an AR study**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Exceeds</th>
<th>Meets</th>
<th>Does not meet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus and purpose or value of the study are clearly defined and described.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questions studied are relevant to the focus.</td>
<td></td>
<td></td>
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<tr>
<td>Evidence collected is directly related to questions being addressed.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Tools used to collect evidence are appropriate to the tasks.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Documentation shows that tools have been consistently and accurately used.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Analysis reflects accurate and objective/reasonable interpretation of data.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Findings reflect a coherent and perceptive summation of the analysis in relation to focus.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Implications for one's own practice reflect clear and logical links between findings and strategies for changing practice.</td>
<td></td>
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</tbody>
</table>

**Rubric for self-assessment of journals**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Exceeds</th>
<th>Meets</th>
<th>Does not meet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thorough, thoughtful reflection consisting of keeping accounts of key thoughts, feelings, and activities related to telementoring your mentee.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thorough, thoughtful reflection consisting of keeping accounts of key thoughts, feelings, and activities related to your learning about action research.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thorough, thoughtful reflection consisting of keeping accounts of key thoughts, feelings, and activities related to progress on your research project.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX I. RESEARCH MODEL: CURIOSITY’S GARDEN

“Curiosity’s Garden”: Research as Inquiry ala Joyce

<table>
<thead>
<tr>
<th>Research Stage</th>
<th>Action</th>
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<tr>
<td>Wonder</td>
<td>I enter the Garden of Curiosity, my collection of seeds and plants growing from questions, dilemmas, passions, incomprehensible injustices. I try to be aware of my personality, abilities, knowledge, understanding, values, ways of knowing, experiences, stance (and biases), relationships, context.</td>
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<td>Explore</td>
<td>I turn my gaze to one area - an issue, concept, or subject. To see better, I widen and deepen my personal lens by locating myself in relation to worldviews, knowledge disciplines, research methods, previous research, experiences of other practitioners. I grapple with a mix of confusion, contradiction, information overload, anxiety, excitement over new connections, new questions, and validation. I try to stay open.</td>
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<td>Focus</td>
<td>Seeing more clearly, I notice what I didn’t see before - something I really care about, the seed born of a question or issue to devote all effort on nurturing to fruition. I give it my full attention, weeding out less relevant or trivial ideas. I make space for it to grow. I find the best methodological path and the best tools. I imagine the future on this path with this issue.</td>
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<tr>
<td>Investigate</td>
<td>I lay out my tools. I prepare myself to be fully responsive - mentally alert, emotionally tuned for both engagement and detachment, ethically sensitive. I immerse myself in the question. I look at it from all angles. My curiosity and caring drive me to continually collect and analyze data about it so that I may understand it as fully as possible. I collect, use, and refine data collection tools and strategies. If all else fails, I create new ones. I stay open and flexible in my responses but with my eyes clearly focused on the question. I grapple with obstacles and dead-ends. (I try not to hope for a mango tree if I begin to see that what I have is an acorn.)</td>
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<td>Analyze</td>
<td>I am in a continual process of using and creating conceptual tools and strategies to order, categorize, analyze, synthesize, and hypothesize about my question. Investigation and analysis are intertwined in a synergistic process. I make connections to the Big Picture. I am aware of spirals, recursions, processes, patterns, and interrelationships. I expect to change myself and my way of seeing. Sometimes I discover I have the wrong focus and have to start again.</td>
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<td>Conclude</td>
<td>Because I’ve lived the question and searched for answers over time, I understand the issue in a new way. I discover that there are answers to my question, insights from my process, new methods or tools, or better practices that can help others. I identify my audience and choose my mode of communication, most likely a written report. I organize the report; frame the findings with connections to the context and the literature; describe data and methods; describe the process and results of the analysis; evaluate the strengths, weaknesses, and contributions of the study; summarize; and recommend further research.</td>
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<tr>
<td>Share</td>
<td>I am in a continual process of sharing ideas and findings, seeking help, getting feedback, learning from others. This culminates in sharing the &quot;final&quot; results as part of a meeting of minds and hearts that leads to new inquiry.</td>
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<td>Reflect</td>
<td>I continually connect with memories of past experiences and previous encounters with the study data. I reflect on my own mental, emotional, and ethical responses. I question my ideas and assumptions and seek alternatives, try to get distance and detachment. I am sensitive to emerging concepts and hypotheses. I probe and realign my values. I write, write, write!</td>
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APPENDIX J

OUTLINE OF RUTH’S FINAL PAPER

The Harvest of Self-Discovery
Crop: Learning Style Awareness Seeds
Harvest Time: Spring 2004 semester
Care Taker: Ruth King

Abstract: Examining how I learn best, led to implications for changes to engage learners. The careful examination of my learning style included analysis of journals, logs between telementor and students, and an intermingling of related studies. Particular focus was given to uncovering biases and preferences for specific kinds of learners. Implications for practice include providing a multitude of strategies in addition to those a teacher may be comfortable with or may rely on more frequently. Although a learning style questionnaire designed by Solomon and Felder was used to identify one’s learning style, it was concluded that the instrument is only as accurate as how well the person understands himself/herself. Thus, an accurate assessment of learning style begins by examining one’s own learning.

Chapter 1: Introduction and Purpose

Preparation of Soil

How you prepare your seeds for planting is very important. It is important to set precedence for how the seeds will be planted and tended to. Soil preparation is particularly important because it will provide the nutrients from which the seeds will use to grow. The introduction and background of the study is the “soil” in which I planted my seeds of self-discovery about my own learning style. It kept me grounded as I began my research and was my anchor as I dove further into analyzing the data I was collecting.

1. Introduction and background of the study
2. Statement of Purpose of the Study
3. Exploratory Research Questions
4. Scope of the study

Chapter 2: Review of the Related Literature

Plowing of Field

Plowing the field allows you to delve deep into “studies” that have come before you. Just as the plow mixes and intermingles the soil at the “surface” from the soil way beneath, review of related literature also attempts to intermingle the current study with studies that have come before it.

1. Review of Studies/Literature
2. Key themes or issues
Chapter 3: Methodology

Describe how will the seeds be planted? Why were the seeds planted that way? What time considerations were made? Describe how

1. Description of your methodology
2. Rationale for choice of methods
3. Description of role as action researcher
4. Description of methodological assumptions and weaknesses
5. Modified Timeline of study
6. Identify your sources of data and description of how you collected data
7. Instruments used

Chapter 4: Harvesting the Crops

Harvesting the 'crops' will lead to an unearthing of various truths and ahas. More importantly, all of the hard work will soon pay off and will lead to a new cycle of planting.

1. Interpretation of the data
2. The significance of your findings

Chapter 5 Summary and Conclusions

1. Conclusions
2. Implications for change

Bibliography

Appendix 1: The Harvest of Self-Discovery
APPENDIX K

OUTLINE OF SARAH'S FINAL PAPER

Building a Relationship in a Virtual Setting...
By Sarah Morris
LIS 699
Spring 2004

Building the Background

Most strategies for effective teaching and communication methods focus primarily on the face-to-face interaction between students and teachers in the actual classroom. As technology continues to change the means by which we learn, students and teachers must adapt to the virtual format and develop new means of building relationships, creating a safe environment, facilitating discussion and providing rigorous and appropriate learning situations.

My Teaching Experience
My Teaching Philosophy
The Study
Definition of Telementoring
Action Research Course

The Research Questions

* How did I adapt my questioning techniques from the physical to the virtual classroom?
* What types of questions did I pose and what strategies for questions did I rely on as a telementor in order to:
  * Build a relationship in which the student felt safe to pose questions and share her ideas
  * Perceive the students' needs (ie. when to validate, clarify, push, let go)
  * Encourage critical thinking
  * Provide space for the student to become an independent learner

My rationale behind my question

Methodology

My Role as a Telementor

Specific roles I played throughout the telementoring process emerged as I analyzed the data. I began to see areas where I served as librarian, teacher, co-learner, cheerleader and supportive listener. Undoubtedly, my role as supportive listener overshadows any of the other roles.

Supportive Listener
Co-learner
Librarian
Teacher
Reflections as Researcher

Successes
Struggles
Reflecting on the Action Research Process
Changes, Insights and Inconsistencies

Conclusions, Recommendations and Future Action

Telementoring Relationships
Where do I go from here?
If I return to this interim report I hope to ...
Recommendations

References

Appendix A: My Role as Supportive Listener
Appendix B: My Role as Supportive Listener - The Internship
Appendix C: My Role as Supportive Listener - Her Comments
Appendix D: My Role as Librarian
REFERENCES


Guzzetti, Barbara and Cynthia Hynd, eds. 1998. Perspectives on Conceptual Change: Multiple Ways to Understand Knowing and Learning in a Complex World.


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