THE RELATIONSHIP BETWEEN CREDE-BASED INSTRUCTION AND STUDENT AUTONOMY IN CLASSROOM LEARNING

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DEDICATION

To S, J, & S.
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ABSTRACT

Classrooms are increasingly diverse, and students must become more autonomous in order to compete in the international community. This study examined how the implementation of the Center for Research on Education, Diversity, and Excellence Standards for Effective Teaching and Learning (CREDE Standards) was related to the student autonomy in culturally and linguistically diverse classroom environments. The CREDE Standards are instructional strategies developed for use with culturally diverse students. Framed from a sociocultural perspective, this study involved two methodological approaches. First, small group activity in two high school classrooms were videorecorded to identify the types and frequencies of students’ self-regulatory behavior. Low and high level examples of the teachers’ use of the CREDE Standards were analyzed to study the relationship between each strategy and student self-regulatory behaviors. Analysis revealed that the types and frequencies of self-regulatory behavior increased in all cases when there was a higher level of implementation of the CREDE Standards. When implementation was low, students exhibited primarily help-seeking behaviors. By contrast, when implementation was high, students demonstrated self-regulatory strategies that included not only help-seeking behaviors, but also organization, critical thinking, monitoring and adjusting progress, self-evaluation and self-reaction. Use of one CREDE Standard, Instructional Conversation, was related to increased levels of student self-regulatory behavior at both lower and higher levels of implementation. The study’s second approach involved a survey of 40 students in four different classrooms to determine how the self-regulatory constructs of self-efficacy, intrinsic value, test anxiety, the use of learning strategies, and self-
regulation changed following their teachers’ CREDE professional development. Analysis revealed that all constructs, except for test anxiety, were affected over the professional development time period. This finding supports the view that teacher implementation of the CREDE Standards contributes to an increase in student self-regulatory behaviors.
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CHAPTER 1

Introduction

The world as we know it is shrinking. Not in a physical way, fortunately, but metaphorically by providing us with the means to eliminate the geographic borders between us. We are becoming global community. More specifically, it is much easier today to affect one another than in years past. Technological innovations, like the Internet, have given us the ability to communicate with people all around the world over distances that would have been unheard of a hundred years ago. While this increased interdependence has the effect of bringing us closer together, it also puts a premium on a society’s educational system to produce individuals that have the skills necessary to compete in the global environment (Power, 2000).

Traditional classrooms were content-driven and teacher-centric. Teachers were responsible for presenting the lessons and assisting students in their attempts at mastery. Students were expected to pay attention and to adjust to the teacher’s instructional style. These classrooms, according to Perry (1998), hindered self-regulation because the activities were too easy and straightforward, opportunities for choice and collaboration were non-existent, and the teacher directed most, if not all, of the instruction. With the globalization of education, classrooms must now become places where students can regulate their own learning, learn from their peers, take responsibility for updating their knowledge and share the things that they learn (Boekaerts, 2002). Classrooms of this type, according to Perry (1998), promote self-regulation because the teacher serves as a guide who presents students with opportunities to: (a) engage in
complex activities, (b) make choices, and (c) collaborate with their peers.

In this study, I examined two byproducts of the shift towards global education to determine their effects on students in the classroom. The first byproduct is the need to address classrooms that are becoming increasingly diverse. Students in the global community are no longer a homogenous group, but rather, a heterogeneous collective with a diverse mix of cultural and linguistic traditions. This study focuses on how one successful program, developed by the Center for Research on Education, Diversity, and Excellence (CREDE), has addressed these needs. The CREDE Standards for Effective Teaching and Learning (Five Standards) are research-based principles for teaching all children, but primarily culturally and linguistically diverse students (Dalton & Youpa, 1998; Tharp, Estrada, Dalton, & Yamauchi, 2000). I chose the Five Standards for two reasons: (a) because they contain pedagogical applications that specifically address the changing complexion of the classroom and (b) they have been shown to increase student achievement in a variety of settings.

The Five Standards provide a generic set of universal principles of pedagogy designed to maximize success for students across all cultures. These standards were born from a search for principles relating to culturally compatible education among culturally and linguistically diverse communities. Tharp and his colleagues found that there was strong consensus in the research community supporting the Five Standards as maximizing teaching and learning for all students (Dalton & Youpa, 1998; Tharp, 2004, 2006; Tharp, Dalton, & Yamauchi, 1994; Tharp et al., 2000; Tharp et al., 1999). Subsequent consensus testing and scholarly review required researchers to seek exceptions to the
propositions they held. This analysis led to the revision but not the exclusion of any of the Five Standards (Tharp, 2006).

The success of the Five standards has been well documented in a variety of different settings by a growing body of research that indicates that teachers’ use of the Five Standards is a reliable predictor of their students’ achievement gains (Doherty, Hilberg, Epaloose, & Tharp, 2002; Tharp, 2004). A study of students in a primarily low-income Hispanic community found that (a) greater levels of teacher implementation of the Five Standards reliably predicted student achievement gains on SAT-9 tests of comprehension, reading, spelling, and vocabulary, (b) English language achievement increased when English was the language of instruction, and (c) achievement gains in comprehension, reading, spelling and vocabulary were greatest when teachers transformed both their pedagogy and the organization of their instructional activities as specified in the Five Standards model (Doherty et al., 2002; Doherty, Hilberg, Pinal, & Tharp, 2003). Estrada (2005) found that English language learners in a low-performing, high-poverty school made reading achievement gains over the course of a four year period that correlated with their teacher’s increasing implementation of the Five Standards. Finally, Hilberg, Tharp, and DeGeest (2000) studied mathematics classrooms at an American Indian middle school and found that teachers’ implementation of the Five Standards was related to students’ better retention and higher test scores.

There are five generic Standards and two additional ones for indigenous students (Tharp, 2006). The first five generic standards (Five Standards) are (a) Joint Productive Activity, in which teachers and students work together to facilitate learning through collaboration and dialogue on relevant educational
products; (b) Developing Language and Literacy across the Curriculum, in which competence in the language and literacy within the subject area is developed; (c) Teaching in Context, in which the student’s prior knowledge and life experiences are connected to meaningful school lessons; (d) Teaching Complex Thinking, in which the process of complex thinking is emphasized, modeled, and taught; and (e) Instructional Conversation, in which teachers and students use a purposeful, sustained dialogue to build shared understanding. The two standards, based on indigenous views of development and child socialization practices, are (a) Modeling and Demonstration, in which students are given the opportunity to learn through observation, and (b) Student Directed Activity, in which student autonomy is encouraged throughout the learning process (Tharp et al., 1994).

The second byproduct of the shift towards global education is the need for students to become more self-regulated learners. In recent years, self-regulated learning has become a key construct in education. Boekaerts and Cascallar (2006) concur, stating that self-regulation has become an important piece of the educational puzzle because of the integral role it plays in contributing to a student’s learning and achievement, not only in school, but in future endeavors as well. The Hawaii Department of Education (HiDOE) (2007) also recognizes the importance of producing students that are responsible for their own learning. In fact, the HiDOE lists the Self-Directed Learner as the first of their six General Learner Outcomes for all grade levels.

Self-regulation has been defined in many different ways. Simply put, it is a multifaceted process where learners actively monitor and adjust their progress towards personal goals by interpreting and incorporating feedback from social, motivational, and behavioral sources (Zimmerman, 1995). The importance of
students being able to self-regulate their learning cannot be overemphasized. Ideally, this instruction would be part of everyday classroom instruction. However, with the curricular demands placed on teachers, it is unlikely that a large portion of instructional time will be devoted to strategy instruction. Cleary and Zimmerman (2004) support this point, stating that successful students have a large selection of effective strategies they can select from and understand how to evaluate and adjust the strategy if it is not working, but that to truly learn how to self-regulate, they need frequent opportunities to practice. Hamman, Berthelot, Saia and Crowley (2000) also agree with this view, stating that while teachers can be an important source for teaching students how to learn, only 9% of instructional time was devoted to the coaching of learning.

How, then, can educators combine effective teaching principles with ways that teach students how to become more self-regulated in their learning, within the framework of the typical school day? I attempt to answer this question by examining the relationship between teachers’ use of principles of effective teaching for students of diverse backgrounds and their effect on students’ autonomy in classroom settings.

Background of the Study

I first became interested in the relationship between teachers’ use of principles of effective teaching for students of diverse backgrounds and students’ autonomy in classroom settings during my years as a secondary school teacher. One of my main goals as a teacher was to give students the opportunity to take charge of their learning. I used to tell my students that I would be happy to teach them the things that they needed to know to be successful in the class, but that I would be delighted if I could guide them as they found ways to learn
things on their own. I likened it to a saying they were all familiar with, the Chinese Proverb attributed to Lao Tzu, the founder of Taoism, “Give a man a fish and you feed him for a day. Teach him how to fish and you feed him for a lifetime.”

To accomplish this goal, I used a variety of instructional strategies designed to teach students self-regulatory behaviors, but had mixed success. While some students took greater responsibility for their learning, other students clearly did not. Surprisingly, I also found similar results during lessons where I was not actively teaching self-regulatory strategies, but focused on contextually relevant material or required students to use higher order thinking skills to solve ill-defined problems.

This discovery initially puzzled me. Fortunately, an opportune introduction to the work the CREDE scholars were doing gave me a means to organize the questions that I had. Once I became familiar with the CREDE Standards, I said, “Hey, I do that. I wonder if there is a connection between the elements of good teaching and the development of students’ self-regulatory behavior?” This thought led me to develop this study.

**Statement of the Problem**

At the present time, although ample research on the Five Standards exists, there is limited research on the two standards for indigenous students. While these two standards were originally thought to be unique to the populations being studied, it is my belief that both Modeling and Demonstration and Student Directed Activity are inseparable from the Five Standards and are expressed in all classes by virtue of teachers correctly implementing the CREDE principles. More research is needed on the CREDE Standards and their effects on student
outcomes. One area of student performance that has not been previously studied, with regard to the CREDE principles, is student autonomy, an aspect of self-regulated learning. In this study, I examine the relationship between the application of CREDE principles and their effects on student autonomy by observing students’ use of self-regulatory strategies through classroom observations and student surveys.

**Research Questions**

The purpose of this study was to investigate the relationship between teachers’ use of principles of effective teaching for students of diverse backgrounds and students’ autonomy in classroom settings. My research questions draw on both sociocultural theory (Vygotsky, 1978), as the overarching theoretical framework for this study, and the contributions made by social cognitive theory (Bandura, 1986).

There are three key questions in this study. The first question addresses how student self-regulatory behavior changes in classrooms based on the level of teacher implementation of the CREDE Standards for Effective Teaching and Learning (Five Standards). Low-level and high-level examples of implementation were chosen to offer the greatest contrast in observed behaviors. The second question, born out of the first, identifies which, if any of the Five Standards play a more important role in producing student self-regulatory behavior. Finally, the third question examines how the five self-regulatory constructs of self-efficacy, intrinsic value, test anxiety, self-regulation, and the use of learning strategies change over time as teachers participate in CREDE professional development.
1. How is teachers’ implementation of the CREDE Standards for Effective Teaching and Learning related to student self-regulatory behavior?

2. Are certain CREDE Standards for Effective Teaching and Learning more likely than others to influence students’ self-regulatory behavior?

3. How do the self-regulatory constructs of self-efficacy, intrinsic value, test anxiety, self-regulation, and the use of learning strategies change over time change as teachers participate in CREDE professional development?

Overview of the Study

This dissertation is organized in the following way: In Chapter 2, I begin by presenting the theoretical framework, where I describe sociocultural theory and present it as the appropriate theoretical perspective for the study. I also discuss why self-regulation in the classroom needs to be examined through a social lens. Next, I describe self-regulation along with the eight self-regulatory categories I used in the study. Support for the use of the categories is included in this section. Then, I describe the relationship between each of the CREDE Standards and student autonomy. This section includes a discussion of how the implementation of each of the Standards attempts to create learning environments that allow students to achieve their personal goals by spontaneous, socially situated learning behaviors. Finally, I present the study in the context of other CREDE research in Hawai‘i.

In Chapter 3, I begin with a discussion of the conceptual underpinnings of the study and the rationale behind using a mixed-methods approach as the research design. Next, I describe the participants in the study, the procedures used to determine the levels of CREDE implementation, and the types of self-
regulatory behavior exhibited by the students. Then, I describe the data
collection procedures, starting with a description of the coding process used for
the videorecordings and ending with the methods used to analyze the student
survey. Finally, I describe the role of the researcher, including how my
relationship as the researcher may have impacted the study, and the steps that I
took to maintain the integrity of the study by minimizing any potential bias.

In Chapter 4, I describe the results from my analysis of the videorecorded
classroom interactions and the student surveys. In the first part of this chapter, I
discuss the results from my examination of two examples of teacher
implementation for each of the Five Standards. In this section, I compare one
low level and one high level example for each Standard and the self-regulated
behaviors exhibited by the students. In the second part of Chapter 4, I describe
the results from my analysis of the Student Surveys. First, I describe the
reliability of each self-regulatory construct on the pre-test and post-test. Next, I
present the interaction effect, main effects and descriptive statistics for each of
the five self-regulatory constructs.

In Chapter 5, I organize the discussion into four main parts: (a) how the
findings from my analysis of the classroom videorecordings and student surveys
answer my research questions; (b) how the findings support the predictions
made by sociocultural theory and the literature on self-regulated learning; (c) the
theoretical and educational implications of the findings; and (d) the possible
future directions and limitations of this study.
CHAPTER 2

Literature Review

I have divided Chapter 2 into three main parts: (a) the Theoretical Framework, b) The Relationship between the CREDE Standards and Student Autonomy, and (c) The Current Study in the Context of Other CREDE Research in Hawai‘i.

I begin the Theoretical Framework section with a discussion of sociocultural theory. I also reveal three potential problem areas of the typical K-12 classroom learning environment along with the solutions offered by the correct implementation of the CREDE Standards. Next, I discuss the critical role that discourse plays in the educational process by examining how Instructional Conversations contribute to self-regulated learning. Then, I describe self-regulated learning along with its relationship to social cognitive theory. Finally, I present the eight categories of self-regulation that I used in the study. In the second section of Chapter 2, I describe the relationship between the CREDE Standards and student autonomy. I present each Standard separately and describe how the Standard is related to self-regulated learning. In the final section, I describe how the current study is related to previous research done in Hawai‘i.

Theoretical Framework

Sociocultural theory. I chose Vygotsky’s (1978) sociocultural theory as the primary lens through which I would examine my research questions. This theory states that development is a social process dependent upon the cultural, historical, and interpersonal factors that make up an individual’s social world.
Vygotsky also believed that learning precedes development. The developmental process lags behind the learning process creating Zones of Proximal Development (ZPD) for each individual. The ZPD is defined as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). According to this theory, for learning to take place, a more capable individual is needed to guide the novice through participation in joint activities that provide the novice opportunities to acquire new strategies and knowledge. Thus, for Vygotsky, learning occurred through the process of social sharing (John-Steiner & Mahn, 1996).

While previous researchers who focused their studies on individual behavior such as problem solving in laboratory settings have provided valuable insight into the process of self-regulation, they did not examine the social contributions Vygotsky deemed to be essential. Neo-Vygotskians suggest that the study of cognitive activity requires examination of the mutual contributions of all the parties involved, including the individual, their partners, and the community or institutional traditions in which they participate (Rogoff, Topping, Baker-Sennett, & Lacasa, 2002). Therefore, to obtain the clearest picture of how learning takes place, we must focus on the social organization of the teaching and learning interactions that influence the individual (Chavajay & Rogoff, 2002). Towards this end, I examined three essential features of the learning environment.

**Critical features of the learning environment.** One critical feature of the learning environment involves the cultural traditions to which the learner is
exposed. Typical U.S. school settings rely on what Rogoff, Paradise, Arauz, Correa-Chavez and Angelillo (2003) describe as “assembly-line instruction” (p. 176) where information is transmitted to the learner by experts outside the context of productive, purposeful activities. According to the authors, this formal, school-based, typically academic mode of instruction is in direct conflict with the more informal, community-based structure, emphasized by many indigenous cultures, called “intent participation” (p. 176) where the learner keenly observes and listens to more expert individuals with the intent of participating once their skill level is appropriate. This disconnect between what the learner is exposed to at home versus what is presented in the school setting can make it difficult for optimal learning to take place. The CREDE model provides students with the opportunity to collaborate with their instructor and make connections to prior knowledge.

A second critical feature of the learning environment involves the structure of the social organization and the direct impact it can have on instruction and how it is contextualized. Chavajay and Rogoff (2002) describe two possible arrangements for the social structure of the learning environment: (a) horizontal and (b) vertical or hierarchical. The horizontal structure is representative of many indigenous groups where cooperation, shared responsibility, and consensus-based decision-making are emphasized. For example, home schooling can provide contextual opportunities for teaching material in culturally compatible ways. The vertical or hierarchical organization is more typically found in Western schools where adults typically take the responsibility for directing the learner’s actions. This dichotomy can present problems for students who come from backgrounds that emphasize a more
group-oriented, social view of the learning process (Mejia-Arauz, Rogoff, Dexter, & Najafi, 2007; Mejia-Arauz, Rogoff, & Paradise, 2005). To help students bridge the gap between the horizontal structure they may be familiar with at home and the vertical structure they may encounter at school, teachers can make use of the CREDE Standard of Contextualization to change the classroom social organization to teach students in culturally compatible ways or try to use strategies linked to how the students learn at home.

A third critical feature of the learning environment is the teacher. Vygotsky (1978) viewed the ideal teacher as someone who actively monitors a novice’s current developmental level and designs learning experiences that are within the student’s ZPD. Vygotsky emphasized the importance of the dialogue that takes place between the teacher and the student during these learning episodes. This dialogue allows the teacher to more fully determine the student’s ZPD and to correct any misconceptions immediately (Mintzes, Wandersee, & Novak, 1993). Subsequent writers suggested that the ZPD is collaboratively created by the novice and more expert other and that students benefit from the shared understanding that is created from these conversations (Bredo, 1997; Lave & Wenger, 1991; Tudge & Winterhoff, 1993; Wells, 2000). In terms of the CREDE model, these interactions would be described as Instructional Conversations.

**Instructional Conversations.** Instructional Conversations are one of the original Five CREDE Standards for Effective Pedagogy and are deeply rooted in Vygotskian theory because it is this dialogue that allows the learner to develop their thinking skills by the questioning and sharing of ideas that can only happen in a conversation (Tharp & Gallimore, 1991). Running counter to the traditional “recitation script” (p. 8) used in many classrooms where the teacher lectures or
assigns work from a text, asks questions and expects the students to display their mastery of the material by giving predictable, correct answers, Instructional Conversations involve a dialogue between the teacher and the student in which the teacher intentionally focuses the discussion towards the learning objective (Tharp & Gallimore, 1991). These conversations, however, are not scripted, but rather natural, spontaneous discussions that create opportunities for a novice to build conceptual and linguistic mastery. The role of the teacher in an Instructional Conversation is that of a guide who presents educationally relevant ideas or concepts to students and encourages them to use their past experience to achieve more sophisticated levels of understanding (Goldenberg, 1991; Tharp & Yamauchi, 1994).

Tharp and Yamauchi (1994) found that teachers and students engaged in productive Instructional Conversations were influenced by four psychocultural factors (a) sociolinguistics, including the expectations of both teacher and student about wait time and tempo, (b) cognition, (c) student motivation, which was increased when culturally relevant materials were used as well as when teachers gave students increased autonomy, and (d) social organization, where student worked in small peer-oriented work groups. The authors also argued that, with respect to the actual teaching practices involved, the Instructional Conversations may include “mediated learning, interpretive discussion, guided practice, quality teaching, reciprocal teaching” (Tharp & Yamauchi, 1994, p. 2).

Instructional Conversations, therefore, require students and teachers to actively participate in the joint creation of knowledge. The students, along with the teacher and other more capable peers, become responsible for co-regulating their own learning (McCaslin & Hickey, 2001). As the level of conversation
increases, so does the learning. Turner et al. (2002) found that the level of instructional discourse was higher in classrooms where students were less likely to use avoidance strategies to protect their self-worth, which allowed for a higher percentage of scaffolding, negotiation and transfer of responsibility between teachers and students. These processes allowed the students to more completely understand what they were learning and also allowed them more opportunities to participate in the co-creation of knowledge.

**Self-regulated learning.** As novice learners attempt to select the actions and operations best suited to achieving their goals, they become more autonomous. Autonomy is one of the main components of self-regulated learning, or more specifically, the ability to learn independently using strategies that learners deem appropriate to meet challenges being faced (Newman, 2002). This definition is similar to the seventh CREDE Standard of Student Directed Activity, which focuses on student-directed activity with regards to selection, participation, and generation of students’ own learning topics and activities (Tharp, 2006).

Over the past 30 years, the definition of what constitutes a self-regulated learner has evolved considerably, moving from a focus on students who are metacognitively aware and strategic in planning their activities to encompassing the interactions between the student’s knowledge, metacognitive skill, motivation and cognition. Recent emphasis, however, has been on how self-regulated learning is related to the knowledge and skill that students construct over time through their actions in a social context (Butler, 2002).

As the study of self-regulation moved from a focus on the fixed characteristics of students to the context-specific processes that these students
used to succeed in school, several key processes became apparent. Zimmerman and Martinez-Pons (1988) tested 14 key self-regulated learning strategies including (a) self-evaluation, (b) organizing and transforming, (c) goal setting and planning, (d) seeking information, (e) keeping records and monitoring, (f) environmental structuring, (g) self-consequences, (h) rehearsing and memorizing, (i) seeking peer assistance, (j) seeking teacher assistance, (k) seeking adult assistance, (l) reviewing tests, (m) reviewing notes, (n) reviewing texts, and found that most, but not all, were predictors of a common construct created from teacher ratings and achievement test scores. The authors also found that self-regulated learners were active participants in the learning process and sought help and information when needed.

Zimmerman (1998) narrowed the strategies down to 11 and cross referenced them with questions students could use while studying. He included the psychological dimensions related to each strategy, the task conditions under which students operated, the self-regulatory attributes the students possessed, and the self-regulatory processes from which the students might choose.

The first question in Zimmerman’s (1998) model, “why,” addressed students’ motives for studying, choice in participation, self-motivation, abilities to set goals, and self-efficacy. The second question, “how,” focused on the methods students used to study, their choices of methods, whether they planned out what to do or if it was a routinely executed behavior, and the task strategies, imagery, and self-instructional methods they could choose from. The third question, “when,” concentrated on students’ effective use of time, their choice of time limits, the timely and efficient use of strategies, and time management. The fourth question, “what,” centered on students’ overt behavioral performances,
their choices of outcome behaviors, self-awareness of performance, and self-monitoring, self-evaluation and self-imposed consequences. The fifth question, “where,” considered the students’ physical environments, choices of setting, the environmental sensitivity and resourcefulness they exhibited in dealing with changing situations, and how they restructured the environment to increase their chances for success. Finally, the sixth question, “with whom,” dealt with the students’ awareness of the social influences related to their studying, how they viewed the choice of a partner, model or instructor as either a help or hindrance, their sensitivity and resourcefulness in help seeking, and the selectiveness they exhibited when seeking help from others.

This analysis showed that the process of self-regulation was not, as stated earlier, a singular fixed characteristic of students but rather something that was multidimensional in scope, and dependent on both the context of the activity and the perceived outcomes. Thus, students’ personal study habits and strategies interact with their perceived performance outcomes and the environment, and therefore, need to be continually adjusted as conditions change (Zimmerman, 1998).

For the purpose of this study, self-regulation is defined by Zimmerman (2002) who describes the study of self-regulated learning as being focused on the “nature, origins, and development of how students regulate their own learning processes” (p.64). He describes self-regulated learning as an active, self-directed, autonomous process through which students transform their mental abilities into academic skills. For these individuals, learning is an activity that is actively pursued rather than something that reactively occurs because of instruction.
**Social cognitive theory.** The social cognitive perspective of self-regulation views the process as a triadic reciprocal interaction between personal, behavioral, and environmental factors where learners direct the learning process by setting goals, applying appropriate strategies, and using self-regulative influences to motivate and guide their efforts (Bandura, 1986; Zimmerman, Bandura, & Martinez-Pons, 1992). This triadic relationship involves actions and covert processes whose presence or absence depends on an individual’s beliefs and motives, which may explain why a person can self-regulate in one type of setting and not in another. Individuals in this view are not independent agents of their own action (autonomous agency), nor are they simply acting due to external influences (mechanical agency), but rather, they are active participants who make decisions based on the feedback gained from the triadic reciprocal interactions (emergent interactive agency) (Bandura, 1989). It is the cyclical nature of this process that allows individuals to use feedback from prior performance to make changes or adjustments to their current efforts (Zimmerman, 2000).

Zimmerman (2002) described self-regulation as being composed of eight component skills as indicated in Table 1. Zimmerman (2002) further refined these skills into a three-phase model that can be used to describe the process of how a student could become a self-regulated learner. The first phase, Forethought, consisted of two sub-processes, (a) Task Analysis, where the student set goals and did strategic planning, and (b) Self-motivation, which was related to the student’s self-efficacy, outcome expectations, intrinsic interest, and learning goal orientation. The second phase, Performance, consisted of two sub-processes, (a) Self-control, which was related to the imagery, self-instruction,
attention focusing techniques, and task strategies the student used, and (b) Self-observation, which included self-recording and self-experimentation. The final phase, Self-reflection, consisted of two-sub-processes, (a) Self-judgment, which included self-evaluation and causal attribution, and (b) Self-reaction, which consisted of the student exhibiting self-satisfaction or an adaptive/defensive stance.

Table 1

*Eight Components of Self-Regulation*

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals</td>
<td>Setting Proximal Goals</td>
<td>Setting a certain date to learn a new language for an upcoming trip to a foreign country.</td>
</tr>
<tr>
<td>Strategies</td>
<td>Adopting Powerful Strategies to attain one’s goals</td>
<td>Using help-seeking behaviors or specific learning strategies such as mnemonics to condense and memorize important material for a speech.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Monitoring performance for signs of progress and how accurately the strategy is being followed</td>
<td>Utilizing a post-game reflection to determine how well the strategies one planned to use were followed.</td>
</tr>
</tbody>
</table>

(continued)
Table 1 (Continued)

Eight Components of Self-Regulation

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restructuring</td>
<td>Changing the physical or social environment to make it compatible with one’s goals</td>
<td>Creating a conducive study environment by removing as many distractions as possible</td>
</tr>
<tr>
<td>Time Use</td>
<td>Managing one’s time efficiently</td>
<td>Setting aside a few hours a day to work on a business presentation instead of putting it together the night before.</td>
</tr>
<tr>
<td>Self-Evaluating</td>
<td>Self-evaluating one’s methods</td>
<td>A teacher doing a post-lesson evaluation to determine how well each part of the lesson went.</td>
</tr>
<tr>
<td>Attributing</td>
<td>Attributing cause to results</td>
<td>Attributing performance to effort rather than external influences.</td>
</tr>
<tr>
<td>Adapting</td>
<td>Adapting future methods</td>
<td>Using information from self-analysis to plan for the future.</td>
</tr>
</tbody>
</table>

Pintrich and DeGroot (1990) found that self-regulation was the best predictor of academic performance and that the level of student learning varied based on the presence or absence of Zimmerman’s (2002) eight factors. For this
study, I define student autonomy as the students’ spontaneous exhibition of these self-regulatory behaviors.

**Self-regulation and different levels of schooling.** Previous research on self-regulated learning across different levels of schooling suggested that middle school and high school students tended to differ in their use of self-regulatory strategies. Zimmerman and Martinez-Pons (1990) studied 45 male and 45 female students in Grade 5, Grade 8 and Grade 11 and found that self-regulated learning strategy use was related to students’ grade level in school, but not always on a consistent basis. For example, the authors found that students decreased their use of reviewing texts as they moved from Grade 5 to Grade 11, but increased their reviewing of notes during the same time period. Similarly, students asked for less adult, parent-type assistance as they moved from Grade 8 to Grade 11, but increased their reliance on teacher assistance during this time period. The study also found that the students’ record keeping, monitoring and organizing of activities appeared to level off after Grade 8 and that increases in goal-setting and planning occurred between Grade 5 and Grade 8, but that a significant decline occurred between Grade 8 and Grade 11.

Tang and Neber (2008) studied 315 American, Chinese and German students in Grade 10 and Grade 12 and found that intrinsic motivation for science learning was significantly lower for students in higher grades for American and Asian students but higher for German students across the same grade levels. Finally, Hong, Peng, and Rowell (2009) studied 330 students in Grade 7 and 407 students in Grade 12 and found that students’ self-regulated learning during time spend doing homework declined from middle to high school. The authors also found that older students viewed homework as less
useful and less enjoyable than their younger counterparts, and therefore put forth less effort and persisted less when they needed to plan or self-check.

The CREDE Standards and Student Autonomy

Students in traditional, vertically structured classrooms tend to passively receive information, relying on their teachers to tell them what, how, when, and to what extent learning will take place (Boekaerts & Niemivirta, 2000). Teachers are expected to provide students with resources and learning materials, to motivate them, and to take responsibility for the learning process by carefully monitoring their progress and providing targeted, relevant feedback. Teachers present declarative and procedural knowledge and the students simply find ways to comprehend, store and activate that knowledge when the time arises. Unfortunately, this situation creates an environment where students do not have enough opportunities to organize and regulate their own learning.

Simply providing students with the opportunity to learn is not enough. Self-regulated learners seek opportunities because they want to acquire new knowledge and skills. Boekaerts and Niemivirta (2000) describe these effective learning episodes as situations where the student is “invited, coached, or coaxed to display context-specific, goal directed learning behavior” (p.418). The learning behavior continues until one of the following conditions are met: (a) the learning goal is attained, (b) the learning goal is partially attained, but this result is acceptable to the learner, (c) the learning goal is deemed to be unattainable, unattractive, or irrelevant, or (d) another more important goal takes the place of the original goal. In the most effective situations, a student’s learning behaviors are self-initiated or spontaneous, cumulative, socially situated, and driven by personal goals. In the traditional school setting, however, these conditions are
rarely met as learning opportunities tend to be fragmented, indirect experiences that are selected by the teacher (Boekaerts & Niemivirta, 2000).

The CREDE professional development model examined in this study attempts to reverse this trend by providing teachers with the skills required to create the conditions necessary active and autonomous student engagement. This study focuses on the relationship between teachers’ use of the CREDE Standards and students’ autonomy in the classroom. In this section, I describe how these concepts are connected.

**Joint Productive Activity and student autonomy.** Joint Productive Activity, the standard that emphasizes teachers and students collaborating together, may at first seem unrelated to student autonomy. However, while self-regulated learners are autonomous, they are not isolated from others in the way they learn because they are able to cope with challenges through a process that Newman (2002) called “adaptive help seeking” (p. 1). This involves students asking for help in order to learn independently, rather than to just get the correct answer. This act is predicated on several implied competencies including students’ knowing (a) when they need help, (b) who the best person is to ask for help, and (c) how to ask a question that gets them the answers that they need. Thus, self-regulatory strategies for autonomous learners can be Vygotskian in nature in that students must often interact with more proficient others in order to gain assistance and regulate their own learning.

Social cognitive theory also supports the idea of collective agency where individuals use the power of shared beliefs to produce their desired results (Bandura, 1986). In this view, the group’s success is not only the product of the shared knowledge and skills of its different members, but also of the synergistic
effect of their interactions. For example, successful students are not always successful in a group setting because they do not always work well with others. Therefore, group success is not simply the sum of the talents of the individual group members but an emergent property created by the interactions of its members and their shared beliefs (Bandura, 2002).

**Language and Literacy Development and student autonomy.** The previously mentioned social interactions lead to students developing language and literacy across the curriculum. This second CREDE standard emphasizes that students need to have opportunities for extended language expression. As described in the previous section, self-regulated learners often depend on social interactions and basic skills like reading and writing to monitor their learning and seek assistance from others.

For Vygotsky, social interactions with more capable peers serve as the means by which the learner is exposed to new learning opportunities and for the use and development of language. The internalization of these language-based social interactions is central to Vygotsky’s theme of historically situated and culturally determined human behavior where self-regulation takes the form of deliberate control of one’s own attention, thought, and action (Fox & Riconscente, 2008).

Wertsch (2008) described four levels of interaction from other-regulation to self-regulation where the student’s understanding of the task (a) is so limited and communication so difficult that the student may respond in ways that have nothing to do with how the more capable peer perceives the task, (b) has increased to the point where responses to specific questions and commands are possible, but not at the level of mastery where inferences can be made, (c)
becomes sophisticated enough to allow the following of non-explicit directives and the beginning of self-regulated learning, and (d) has developed to the point where assistance from the more capable peer is no longer needed.

**Contextualization and student autonomy.** Contextualization refers to teachers’ making connections between what students are learning and their prior knowledge from home, school, and community. Teachers who contextualize learning for their students may promote students seeing both the relevance of what they are learning and also understanding how the broader environment is important. Zimmerman (1989) found that self-regulated learning involves students’ careful analysis of the context to pick appropriate strategies that can help them achieve their goals. As the learning opportunity unfolds, students actively construct a relationship between prior knowledge and current learning (Pintrich, 2000). Students attempt to self-regulate their behavior based on two priorities described by Boekaerts and Niemivirta (2000) in their model of adaptable learning: (a) the need to extend their knowledge and skills to increase their personal resources and (b) the desire to maintain their available resources to prevent loss, damage or distortions to their well-being. The context dependent nature of self-regulation becomes evident when new performance problems reveal the limitations of a learner’s existing strategies. Additional social learning experiences are then required to develop the strategies needed to solve the new problem (Zimmerman, 2000).

**Complex Thinking and student autonomy.** While connecting the learning experience to the students’ lives is an important contributor to self-regulated learning, the complexity of the task and the feedback given to the students to improve their performance is also important. Perry, VandeKamp,
Mercer, and Nordby (2002) found that more complex, open-ended tasks produced more self-regulated learners than simple, closed-ended tasks. This CREDE standard also involves teachers providing students with feedback and knowledge of the criteria on which their performances will be judged. Related to this, Perry et al. (2002) and Zimmerman (2000) found that teacher support was critical in allowing the students to become more autonomous in these situations where student self-regulatory development could be greatly increased when teachers modeled strategies and verbalized their thought processes as they performed an activity. Teachers, however, must be careful to give appropriate focused feedback because increased praise for student effort in a failing strategy was shown to be detrimental, producing mindless, undirected effort evidenced by students working faster, producing more material, increasing the number of responses, and randomly repeating answers (Boekaerts & Niemivirta, 2000).

**Instructional Conversation and student autonomy.** The Instructional Conversation is by definition a social activity, which, although not pre-scripted, is carefully planned to accomplish specific instructional goals. This social aspect and careful planning are vitally important because self-organized learning without a teacher’s social guidance may actually impede a student’s acquisition of knowledge (Pintrich, 2000).

While the Instructional Conversation is an effective social endeavor, it cannot be used all the time simply because of classroom logistics, nor should it be because students need time to think and reflect about what they have learned. An Instructional Conversation is most beneficial when used more than once a week as a regular part of the class, and in small groups of three to seven students.
(Dalton & Youpa, 1998). While a teacher facilitates a discussion with a small
group of students, the other students in the class must work independently on
other assigned tasks. Thus, a classroom that is designed for Instructional
Conversations supports and contributes to student autonomy by providing
opportunities for students to plan activities, organize their time and to work
independently or in groups.

This brings up another important point, that of classroom context. To be
successful in any classroom endeavor, including Instructional Conversations,
students must be aware of the classroom norms (e.g., the procedures for
completing assignments, how to work with others, and the level of autonomy
granted to the students). In student-centered classrooms, students have more
control over the classroom climate and structure and are often allowed to design
their own projects, create their own groups, design data collection and
procedural steps for completing activities, and even negotiate with the teacher
about how they will be evaluated. In these classrooms the highest incidence of
teacher conversation should take place in the initial learning stages, and as the
individual becomes more competent and self-regulated, social support can be
systematically reduced (Zimmerman, 2000).

**Modeling and student autonomy.** While teacher instruction may be
enough to allow the self-directed learner to achieve success, teachers should also
model the correct procedures for their students. Bandura (1977) suggested that
students who participate in these observational learning experiences would be
able to increase their knowledge base vicariously. In fact, Mayer (1997) found
that combining verbal and visual instructions generated 75% more creative
solutions to problems than verbal instructions alone. Bandura (1995), in later
work, supported the idea of students exercising control over their lives by influencing the areas they could control in order to reach the goals they set for themselves.

This is not to say that students can become self-regulated learners simply through vicarious observation. Zimmerman (2000) described four developmental levels of regulatory skill: Observation, emulation, self-control, and self-regulation. The first level, observation, involves a learner vicariously acquiring a skill from a more proficient individual. The second level, emulation, is achieved when the learner’s performance approximates that of the model. The learner’s accuracy in this stage can be increased when the model adopts a teaching role and provides guidance, feedback, and social reinforcement during the practice phase. The third level, self-control, is achieved when the learner masters the skill to the degree that it can be replicated in settings outside of the presence of the model. The most successful learners in this stage use strategies that emphasize fundamental processes rather than outcomes. The final level, self-regulation, occurs when the learner can adapt performance to changing personal and environmental factors. The selection of task strategies and adjustments are selected using outcome-based feedback without dependence on the model.

**Self-Directed Activity and student autonomy.** As Tharp (2006) pointed out in his description of the seventh CREDE standard, Self-Directed Activity, at the highest level of this Standard, students (a) are involved in the design and development of teaching and learning tasks, (b) take an active teaching role with their peers, and (c) use their expertise and funds of knowledge in the classroom.
Self-directed learners will manage and control their effort on classroom academic tasks in the face of distraction (Pintrich & DeGroot, 1990).

At the most basic levels of self-regulation, students use task analysis or planning to select or alter their self-regulatory strategies (Zimmerman, 1989). This rudimentary planning stage involves clarification for novice learners about procedural issues like task clarification. More expert learners, on the other hand, are able to accomplish these lower level tasks automatically and are more able to achieve a conceptual grasp of the problem and select the most appropriate strategy to solve the problem being faced (Paris & Newman, 1990). This view was confirmed by Turner and Meyer (2000), who found that higher ability students in a small group setting used a teacher-like discourse pattern in helping lower achieving students. These more advanced, autonomous learners clearly understood the basic process, did not need to ask for much clarification, and were able to use their expertise to help others. Thus, these more autonomous individuals should be able to engage in more academically rigorous activity (Rosenshine, 1978).

**The Current Study in the Context of Other CREDE Research in Hawai‘i**

In this study, I investigated students’ use of the eight self-regulatory skills proposed by Zimmerman (2002) and its relationship to teachers’ implementation of the CREDE Standards. The State of Hawai‘i with its multiethnic composition has been fertile ground for CREDE based instruction and research. Early research at the Kamehameha Early Education Program provided a foundation for the development of the CREDE Standards (Tharp et al., 1994). More recently, researchers have provided professional development on the Five Standards to teachers at Wai‘anae High School and studied the effects on their instruction,
knowledge, and beliefs (Yamauchi, Taum, & Wyatt, 2006; Yamauchi, Wyatt, & Taum, 2005). This study is part of a 3-year CREDE project that investigates the effects of professional development for two groups of teachers who work in schools serving large concentrations of Native Hawaiian students (Yamauchi, 2006). All teachers and students in the current study were participants in the broader CREDE project.
CHAPTER 3

Method

In Chapter 3, I begin with a discussion of the conceptual underpinnings of the study and the rationale behind using a mixed-methods approach as the research design. Next, I describe the participants in the study, the procedures used to determine the levels of CREDE implementation and the types of self-regulatory behavior exhibited by the students. I then describe the data collection procedures, starting with a description of the coding process for the videorecordings and ending with how the student surveys were analyzed. Finally, I present my role as the researcher, how this role as researcher may have influenced the study, and the steps taken to maintain the integrity of the study by minimizing any potential bias.

Research Design Rationale

This study examined student behavior on multiple levels. First, I studied the effects of the level of CREDE implementation on student autonomy. Then, I examined the impact of grade level and self-regulatory construct on student behavior. In both of these cases it was important to see not only what the students were saying and doing, but also to gain a deeper understanding of what the students were thinking.

Conceptual underpinnings of the study. I utilized a post-positivist paradigm as the conceptual underpinning for this study, due to the complex nature of the classroom interactions being studied. Based on this paradigm, the reality that existed in each of the classroom observations and contained within the student survey responses, though dutifully recorded and analyzed, could
only be considered approximations of what actually happened. Post-positivists argue that the nature of the universe can never be completely known because of the limitations of human inquiry (Hatch, 2002). The author also suggests that post-positivist researchers remain objective with respect to the phenomena they are studying to make sure that their findings are driven by the data and not their impressions. Based on this paradigm, I chose the Grounded Theory approach as the method that would provide the most rigorous ways of testing the data and determining validity of inference based upon the emergent categories.

The main reason I chose Grounded Theory as the methodology was because, if successful, it would produce a theory or theories that were specific to everyday, real-world situations, and more importantly, applications in education that were useful in practice (Merriam, 1998). I scrutinized three aspects of the study to ensure that the assumptions, procedures, results and conclusions were accurate: (a) internal validity, (b) reliability, and (c) external validity. I used triangulation, peer review and clarifying researcher biases as tests for internal validity to determine how well the research findings matched the current reality. I used triangulation and a peer auditor as tests for reliability to determine if the research findings could be easily replicated and by explaining the role of the researcher. Finally, I used rich, thick descriptions to test external validity to determine whether the findings could be generalized and applied to other situations (Merriam, 1998).

The Mixed-methods approach. The mixed-method research design provided the best integration of both of these criteria. For this study, I used the definition of mixed-methods research provided by Johnson, Onwuegbuzie and Turner (2007):
Mixed methods research is an intellectual and practical synthesis based on qualitative and quantitative research; it is the third methodological or research paradigm (along with qualitative and quantitative research). It recognizes the importance of traditional quantitative and qualitative research but also offers a powerful third paradigm choice that often will provide the most informative, complete, balanced, and useful research results. (p. 130)

The mixed-method approach was appropriate for this study for the following four reasons: (a) both qualitative and quantitative research share the common goal of trying to understand the world we live in, (b) both methods are committed to rigor in the research process and the goal of discovering and sharing practical knowledge, (c) combined research is useful in areas that involve complex phenomena and a large number of perspectives, and (d) debate as to whether qualitative or quantitative is superior will not get the research done (Sale, Lohfeld, & Brazil, 2002).

While I could have chosen a solely qualitative or quantitative view, the mixed-method approach offered the most complete view of what was happening in the classrooms. This view is supported by Johnson and Onwuebuzie (2004) who state that the goal of the mixed-method approach is not to replace either a purely qualitative or quantitative approach, but rather to use an approach that benefits from the strengths of each approach while minimizing the weakness of each. Numerous other scholars agree on this point as well, stating that the mixed-method approach offers the researcher an opportunity to use both the qualitative and quantitative methodologies to complement rather than compete against one another (Hanson, Creswell, Plano-Clark, Petska, & Creswell, 2005;
Jick, 1979; Johnson & Onwuegbuzie, 2004; Johnson, Onwuegbuzie, & Turner, 2007; Onwuegbuzie & Johnson, 2006; Sale, Lohfeld, & Brazil, 2002).

The specific type of mixed-method design I used in this study was a concurrent mixed design. The research carefully followed the four main characteristics of this design suggested by Onwuegbuzie and Johnson (2006): (a) both data sets were collected separately at approximately the same time, (b) neither data analysis was used to build on the other during analysis, (c) results were not consolidated until both sets of data were collected and analyzed, and (d) after the data were collected and interpreted, a big picture view integrated the information.

The data sources for the study included videorecordings of the classrooms of two teachers who participated in a professional development program on the CREDE Standards. Data also included surveys of students’ perspectives on their self-regulated learning. Students who completed the self-reported survey included those enrolled in the two teachers’ classroom and other students whose teachers were involved in the professional development program. In the next sections, I describe the methods for the collection of both data sources in more detail.

**Classroom Videorecordings**

**Participants.**

*Teachers.* Participants included one male and one female teacher from a public high school on Oahu located in a Hawaiian Homestead area. Hawaiian homestead land was set aside for native Hawaiians by the U. S. government, through the Hawaiian Homes Commission Act of 1920 (HHCA), with the intent of creating economic self-sufficiency through the provision of land. Native
Hawaiians are defined by the HHCA as individuals who have at least 50% Hawaiian blood. The homestead agreement provides direct benefits to native Hawaiians in the form of homestead leases with an annual fee of $1 for land that may be used for residential, agricultural or pastoral purposes. The original lease term of 99 years was extended in 1990 by the Hawaii legislature to an aggregate term not to exceed 199 years (Department of Hawaiian Homelands, n.d.).

I chose the two teachers because they were representative of the teacher makeup of the school. That is, the school has two distinct groups of teachers, those who were born and raised in Hawai‘i and were familiar with the community and a second group who were primarily from the U.S. continent. The male science teacher, representative of the continent group, had been teaching for 24 years, but was new to Hawai‘i, having moved from the West Coast of the continental U.S. four years prior to the study. The female Hawaiian language teacher, representative of the group born and raised in Hawai‘i, grew up and lived in the community she taught, and had been a teacher for eight years. Both teachers had been at the school for three years. The teachers were participants in a broader project, which was designed to provide professional development for teachers of Native Hawaiian students using the CREDE Standards (Yamauchi, 2006).

Students. Student participants were recruited from the classrooms of the two teachers. The participating students in both teachers’ classes were juniors and seniors in high school. Thirteen students were members of a chemistry class and eleven students were members of a Hawaiian language class. Prior to enrolling at the public high school, two of the students in the Hawaiian language
class attended a Hawaiian immersion school, where the Hawaiian language was the primary medium of instruction.

Participation in this study was voluntary. All adult participants signed an informed consent form. Student participants under 18-years-old signed an assent form and their parents or guardians also signed a consent form. Consent and assent forms are presented in Appendices A, B, C and D.

**Teachers’ videorecorded instruction.** Teachers were videorecorded while teaching prior to receiving professional development. After the teachers received the professional development, I videorecorded them 2-3 times during each semester of the 2007-2008 academic year, using two cameras focused on different groups or events during each of the sessions. In general, the videorecordings captured the teachers’ interactions with the students and lasted for the duration of the instructional period. Teachers knew in advance when they would be videorecorded.

**Measure of CREDE implementation.** Prior to data collection, I trained the coders using archived videorecordings of classroom instruction to familiarize them with the standards and the use of the Standards Performance Continuum (SPC). The SPC is an instrument used to assess the fidelity of the implementation of the CREDE Standards. Forms related to the use of the SPC are presented in Appendices E, F G, and H. Two independent coders used the SPC to rate the extent to which the videorecorded lessons indicated use of each CREDE Standard. Ratings, as presented in Table 2, were based on a four-point scale described by Doherty et al. (2003).
Table 2  
*Standards Performance Continuum Rating Scale*

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
<th>General Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not Observed</td>
<td>The Standard was not observed</td>
</tr>
<tr>
<td>1</td>
<td>Emerging</td>
<td>One or more elements of the Standard were enacted</td>
</tr>
<tr>
<td>2</td>
<td>Developing</td>
<td>The teacher designed and enacted activities that demonstrated a partial enactment of the Standard</td>
</tr>
<tr>
<td>3</td>
<td>Enacting</td>
<td>The teacher designed, enacted, and assisted in activities that demonstrated a complete enactment of the Standard</td>
</tr>
</tbody>
</table>

Doherty et al. (2002) studied the validity and reliability of the SPC. The authors found three items of interest. First, the SPC exhibited high inter-rater reliability for teacher observations across a wide range of grade levels and across a large number of subject areas. This is similar to results of another study by Doherty et al. (2003) who found a high level of inter-rater reliability for the total SPC scores in a study of 15 teachers and 266 students in a public school in Central California. Second, with respect to concurrent validity, the SPC exhibited theoretically meaningful relationships to comparison measures, the Teacher Roles Observation Schedule (TROS) (Waxman, Wang, Lindvall, & Anderson, 1990) and the Classroom Observation Measure (COM) (Ross & Smith, 1996). This result indicated that teachers who used more of the TROS and COM pedagogical strategies were more likely to implement the standards at a higher level. Finally, with respect to criterion-related validity, greater implementation of the Standards was reliably associated with higher student achievement (Doherty et al., 2002).
Measure of autonomy and self-regulation. Two trained coders analyzed the videorecorded lessons to determine whether the students spontaneously engaged in self-regulatory activities. The observational instrument used for recording student autonomous behavior was adapted from Perry (1998). The instrument, presented in Appendix I, included three sections. The first section provided information on when and where the observation took place. The second section included space to keep a running record of the events that took place in the classroom. The third section listed the self-regulated student behaviors of interest to the studies, including (a) Goals, (b) Strategies, (c) Monitoring, (d) Restructuring, (e) Time Use, (f) Self-Evaluating, (g) Attributing, and (h) Adapting as presented in Table 1. I used this list as a conceptual framework for the classroom observations and coding of the observations. The coders used a second coding sheet based on Zimmerman’s (2002) three-phase model to record the self-regulated student behaviors in the videorecorded lessons. However, I encouraged the observers to refine or expand these categories based on their observations of the videorecorded lessons. An example of this coding sheet is presented in Appendix J.

Data analysis.

SPC coding. I analyzed all of the videorecordings that I made in their entirety. Additionally, I analyzed all additional recordings of the two teachers’ classes made for the broader CREDE project that took place over the time period of the project. In all, I examined over 20 hours of videorecordings. I coded each videorecording using the SPC. After completing this aspect of the coding process, I decided to use the small group as my unit of analysis because I wanted
to look at the total number of self-regulatory behaviors the students exhibited while interacting in small group activities with each other and their teachers.

Higher scores (Level 3) indicated a greater implementation and lower scores (Level 1) indicated a lesser implementation (Doherty et al., 2002). I used Level 1 SPC scores as the lowest level of implementation because not enough observable student behavior would have been present in Level 0 situations because of the limited amounts of task complexity and cognitive complexity involved during the lowest level situations. I used two cameras, in different locations, to capture the videorecordings. The initial unit of analysis was the lesson, which I rated using the SPC. Then, I reviewed the each lesson and determined the excerpt of the lesson that would provide the best audio quality and observable instances of student behavior. The specific criteria I used to rate the videorecordings at each level for the Standards are indicated in Tables 3 through 7 below.
Table 3

*Joint Productive Activity Rating Scale*

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not Observed</td>
<td>Joint Productive Activity was not observed.</td>
</tr>
<tr>
<td>1</td>
<td>Emerging</td>
<td>Students were seated with a partner or group, AND (a) collaborated or assisted one another, OR (b) were instructed in how to work in groups, OR (c) contributed individual work, not requiring collaboration, to a <em>joint product</em>.</td>
</tr>
<tr>
<td>2</td>
<td>Developing</td>
<td>The teacher and students collaborated on a joint product in a whole-class setting, OR students collaborated on a joint product in pairs or small groups.</td>
</tr>
<tr>
<td>3</td>
<td>Enacting</td>
<td>The teacher and a small group of students collaborated on a joint product.</td>
</tr>
</tbody>
</table>

*Note.* Definitions for *italicized* words are presented in Appendix F.
### Table 4

**Language and Literacy Development Rating Scale**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not Observed</td>
<td>Language and Literacy Development was not observed.</td>
</tr>
<tr>
<td>1</td>
<td>Emerging</td>
<td>The teacher explicitly modeled appropriate language; OR (b) students engaged in brief, repetitive, or drill-like reading, writing, or speaking activities; OR (c) students engaged in social talk while working.</td>
</tr>
<tr>
<td>2</td>
<td>Developing</td>
<td>The teacher provided structured opportunities for academic language development in sustained reading, writing or speaking <em>activities</em>.</td>
</tr>
<tr>
<td>3</td>
<td>Enacting</td>
<td>The teacher designed and enacted instructional activities that <em>generated</em> language expression and development of <em>content</em> vocabulary, AND <em>assisted</em> student language use or literacy development through questioning, rephrasing, or modeling.</td>
</tr>
</tbody>
</table>

*Note.* Definitions for *italicized* words are presented in Appendix F.
Table 5

*Contextualization Rating Scale*

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not Observed</td>
<td>Contextualization was not observed.</td>
</tr>
<tr>
<td>1</td>
<td>Emerging</td>
<td>The teacher (a) included some aspect of students’ everyday experience in instruction, OR (b) connected classroom activities by theme or built on the current unit of instruction, OR (c) included parents or community members in activities or instruction.</td>
</tr>
<tr>
<td>2</td>
<td>Developing</td>
<td>The teacher made <em>incidental</em> connections between students’ prior experience/knowledge from home, school, or community and the new activity/information.</td>
</tr>
<tr>
<td>3</td>
<td>Enacting</td>
<td>The teacher <em>integrated</em> the new activity or information with what students already knew from home, school, or community.</td>
</tr>
</tbody>
</table>

*Note.* Definitions for italicized words are presented in Appendix F.
Table 6

*Complex Thinking Rating Scale*

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not Observed</td>
<td>Complex Thinking was not observed.</td>
</tr>
<tr>
<td>1</td>
<td>Emerging</td>
<td>The teacher (a) accommodated students’ varied ability levels, OR (b) connected student comments to content concepts, OR (c) set and presented standards for student performance, OR (d) provided students with feedback on their performance.</td>
</tr>
<tr>
<td>2</td>
<td>Developing</td>
<td>The teacher designed and enacted activities that connected instructional elements to academic content OR advanced student understanding to more complex levels.</td>
</tr>
<tr>
<td>3</td>
<td>Enacting</td>
<td>The teacher designed and enacted challenging activities with clear standards and performance feedback, AND assisted the development of more complex thinking.</td>
</tr>
</tbody>
</table>

*Note.* Definitions for *italicized* words are presented in Appendix F.
Table 7  
*Instructional Conversation Rating Scale*

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not Observed</td>
<td>Instructional Conversation was not observed.</td>
</tr>
<tr>
<td>1</td>
<td>Emerging</td>
<td>With individuals or small groups of students, the teacher (a) responded in ways that were comfortable for students, OR (b) used questioning, listening or rephrasing to elicit student talk, OR (c) conversed on a nonacademic topic.</td>
</tr>
<tr>
<td>2</td>
<td>Developing</td>
<td>The teacher conversed with a small group of students on an academic topic AND elicited student talk with questioning, listening, rephrasing, or modeling.</td>
</tr>
<tr>
<td>3</td>
<td>Enacting</td>
<td>The teacher designed and enacted an Instructional Conversation with a clear <em>academic goal</em>; listened carefully to assess and assist student understanding; AND questioned students on their <em>views</em>, judgments, or rationales. Student talk occurred at higher rates than teacher talk.</td>
</tr>
</tbody>
</table>

*Note.* Definitions for *italicized* words are presented in Appendix F.
**Self-regulated behavior coding.** The coding for student autonomous behavior involved a three-step process. First, I trained the coders using classroom videos of teachers not related to my project and the observational instrument presented in Appendix J. The coders watched the videos and independently used the observational instrument to document the self-regulated behaviors they observed. After the coders completed the observational instruments, we discussed each person’s findings, noting what may have been missed, and clarifying any questions about what a specific self-regulated behavior might look like. This process, which averaged two hours for each coder, continued until each coder was comfortable using the observational instrument.

Second, the coders watched the selected high and low videorecordings in their entirety and documented the students’ self-regulated behaviors on the observational instrument presented in Appendix J.

The final step in coding student self-regulated behavior involved a grounded theory approach because there were many possible codes that could be used to define self-regulation. I reviewed the videorecordings to determine what behaviors, aside from the eight components proposed by Zimmerman (2002), might also constitute self-regulatory behavior. Once this process was complete, I categorized the phenomena and named the categories. For example, one category of Zimmerman’s (2002) “strategies” component focused on the type of assistance sought out by the students. My observations indicated that the students sought help from the teacher, their peers, and the environment, and these three sources became the names for the subcategories. This process, referred to by Strauss and Corbin (1990) as axial coding, allowed for categories
and subcategories to emerge from the existing data. Finally, as I developed the properties of each category, I checked to see if further refinement of the categories was needed and attempted to see what story the data told (Strauss & Corbin, 1990).

I analyzed the videorecordings at least twice to see if there was something present in the data that was not previously recognized or categorized.

For my analysis, I selected one activity per observation. However, the total number of self-regulated student behaviors varied for each observation, along with the number of students participating and the total length of time for the activity. In order to control for the number of students and the amount of time, I created a variable that I named “Behavior per Student per Time (Minute)” (BST). The BST was calculated by dividing the total number of student self-regulated behaviors observed by the total number of students participating and the total time of the observation, in minutes. The resulting calculations indicated the number of self-regulated student behaviors that occurred in each activity per student per minute of observed time.

Limitations. In any classroom situation, behaviors may go unnoticed simply because so many things occur at any given moment. A single observer, focused on one event, might miss other potentially rich instances that occurred simultaneously in another place. I incorporated three methods to minimize the chance of missing important events: (a) a running record of student behaviors, (b) multiple viewings of the videorecordings to catch things that may have been missed during previous viewings, and (c) having at least two other people watch the videos to catch anything that only a single observer might have missed. The decision of what to observe at any given moment was decided using a two-step
process: (a) for large group instruction, I scanned the classroom and tried to capture as much of the action as possible, and (b) for small group instruction, I focused the cameras on the groups closest to the camera, recording two groups at one time.

A second limitation is that the students’ thought processes may go unnoticed because they were not being verbalized. For example, if a student used prior knowledge to monitor progress on an experiment and made adjustments to a procedure based on this knowledge, the internal dialogue was not something that could be captured unless it was verbalized. The ideal solution would have been to ask the students questions immediately after each instance. However, due to its intrusive nature and potential to bias my results, I did not choose this solution. Instead, I chose three less intrusive methods: (a) running records, (b) multiple viewings of videorecordings, and (c) multiple coders to determine what student actions were taking place. I discuss other potential problems in the Role of the Researcher section.

**Student Survey**

**Participants.** Student participants were recruited from the classrooms of three teachers who were enrolled in the CREDE Professional Development program during the 2007-2008 school year. For the purposes of this study, I will refer to students in Grades 7 and 8 as “middle school students” and students in Grades 9-12 as “high school students.” Therefore, there were a total of 27 high school students and 13 middle school students in this study. Descriptions of each class are presented in Table 8.

Participation in this study was voluntary. All adult participants signed an informed consent form. Student participants under 18-years-old signed an
assent form and their parents or guardians also signed a consent form. Consent and assent forms are presented in Appendices A, B, C and D.

Table 8

*Class information for Survey Takers*

<table>
<thead>
<tr>
<th>Subject</th>
<th>n</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Hawaiian Language</td>
<td>6</td>
<td>11, 12</td>
</tr>
<tr>
<td>Advanced Hawaiian Language</td>
<td>11</td>
<td>11, 12</td>
</tr>
<tr>
<td>Social Studies</td>
<td>10</td>
<td>9, 10, 11, 12</td>
</tr>
<tr>
<td>Science</td>
<td>13</td>
<td>7, 8</td>
</tr>
</tbody>
</table>

*Motivated Strategies for Learning Questionnaire.* Student participants completed the survey during one class period at the beginning of the school year in August and at the end of the school year in June. The survey, developed by Pintrich and DeGroot (1990), was used to measure their self-reported use of self-regulatory behaviors. For the initial creation of the survey, the authors administered a 56-item Motivated Strategies for Learning Questionnaire (MSLQ) that included items on student motivation, cognitive strategy use, metacognitive strategy use, and management of effort and used factor analysis to guide their scale construction. This resulted in the exclusion of some items from the scales due to a lack of correlation or stable factor structure. Analysis of the motivational items revealed three factors: self-efficacy, intrinsic value, and test anxiety. Analysis of the cognitive scales revealed two factors: cognitive strategy use and self-regulation. The resulting instrument, presented in Appendix K, contained 44 items representing five constructs: (a) intrinsic value, which consisted of nine questions, (b) self-efficacy, which consisted of nine questions,
(c) test anxiety, which consisted of four questions, (d) cognitive strategy use, which consisted of 13 questions, and (e) self-regulation, which consisted of nine questions. Each question presented students with a 7-point Likert scale (1 = not at all true of me to 7 = very true of me) on which they were asked to rate their self-regulatory behaviors in the respective classrooms. Specific information for survey items relating to each construct is presented in Appendix L.

Pintrich and DeGroot (1990) confirmed that each set of items measured a single, unidimensional, latent construct by conducting a Cronbach’s α test on each of the remaining test items. The inter-item correlation for each of the respective constructs all exhibited acceptable reliability (> 0.70) as indicated in Table 9.

### Table 9

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach’s α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Value</td>
<td>.87</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>.89</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td>.75</td>
</tr>
<tr>
<td>Cognitive Strategy</td>
<td>.83</td>
</tr>
<tr>
<td>Self-Regulation</td>
<td>.74</td>
</tr>
</tbody>
</table>


**Data analysis.** I analyzed the student surveys using Statistical Package for the Social Sciences (SPSS) software. Students answered the 7-point Likert scale (1 = not at all true of me to 7 = very true of me) based on their behavior in the
respective classrooms. I used a repeated measures ANOVA to compare how student behavior in the pre-test and post-test was related to grade level with respect to each of the constructs (Intrinsic Value, Self-Efficacy, Test Anxiety, Cognitive Strategy, and Self-Regulation).

I then analyzed the scores on the student survey to determine whether there was a change in the aspects of student performance in each classroom over time. I also compared each class at the beginning and end of the study to determine if the level of students’ perceived autonomy increased over time. I then compared scores from the middle school students with that of those in high school.

Role of the Researcher

In my role as the researcher, I needed access to the classrooms of the teachers being videorecorded and needed to develop trust and rapport with both the teachers and students. I gained access to the classrooms easily, as the teachers were already being videorecorded as part of a larger study. I met with the teachers, discussed the research I planned, and asked if they would allow me to study their classrooms. Upon receiving a positive answer, I began the study.

As a teacher with over 15 years of secondary and college teaching experience in both public and private school settings, I believe that I have a unique perspective into this research. This assumption is supported by Winne and Perry (2000) who point out that teachers, by virtue of their interactions with students “are uniquely positioned to judge qualities of students’ self-regulated learning” (p. 547). This position, however, also comes with its own set of potential problems. More specifically, there could be potential bias associated with researcher effects.
Miles and Huberman (1994) noted a variety of potential pitfalls associated with the researcher effects on the site and of the site on the researcher. I made specific attempts to minimize these effects in the following ways: (a) using unobtrusive measures whenever and wherever possible to minimize disruptions and undue influence on the subjects, (b) making my intentions clear to the parties involved, (c) thinking conceptually to minimize sentimental or interpersonal thoughts, (d) using multiple data sources to triangulate my findings, and (e) using a colleague to examine my procedures and data to determine whether or not I was being misled.

**Confirmation bias.** According to Nickerson (1998), confirmation bias refers to the process of “unwitting selectivity in the acquisition and use of evidence” (p. 175). In this study, my role as researcher might have caused me to unintentionally collect data that fit my own preconceptions and to interpret the results based on preconceived notions of what I thought I might find. Nickerson (1998) identified five ways that confirmation bias might occur: (a) having a singular focus on a favored hypothesis where no attention is given to possible alternative hypotheses; (b) “my-side bias” (p. 178), where evidence supporting one’s existing beliefs or opinions is given preferential treatment; (c) looking only at positive cases; (d) overweighting positive results; and (e) seeing the patterns one is looking for regardless of the evidence. To reduce the effect of these biases, Creswell (1998) suggested that investigators use at least two different procedures to ensure that the standards of quality and verification were present in any study. In order to be as rigorous as possible and to decrease the effect that my own biases may have had in the study, I chose to use four of the procedures...
suggested by Creswell (1998): (a) clarifying researcher bias, (b) peer debriefing, (c) a peer audit, and (d) triangulation.

**Clarifying researcher bias.** Creswell (1998) recommends that researchers clarify their position and any potential biases or assumptions at the beginning of their study to minimize the effect these factors may have on their research and interpretation of data. In addition to the potential biases mentioned in the Role of the Researcher and Confirmation Bias sections, my prior experience as a teacher in both private and public secondary schools could lead to two additional biases.

First, having taught well over a thousand students, I could have been prone to over interpreting what students were thinking. More specifically, I might have taken what I know students were thinking in several previous instances and attributed the same characteristics to a similar situation in this research. For example, if several previous students had exhibited a certain set of body language cues during a critical thinking episode, like looking downwards, pausing briefly, then looking upwards with a slightly cocked head and raised eyebrow, I might have been prone to attributing the same thought process to students in this research if the same cues were present.

Second, due to the student-centered teaching style that I used in secondary settings that were similar to the ones being observed during this study, I might have been prone to give students the “benefit of the doubt” when it comes to interpreting their actions. For example, if students dug into their backpack, pulled out a notebook and referred to it during an observation, I could have easily interpreted this action as their using an environmental help-seeking
behavior, whereas, they might actually have just been checking to see if they did the homework for their next class.

In order to minimize these two potential biases, I had multiple coders look at the videorecordings to confirm what I thought was taking place. I also enlisted the help of a peer debriefer to provide an additional external checking mechanism.

**Peer debriefer and peer audit.** Lincoln and Guba (1985) defined the role of a peer debriefer as someone who is neutral towards the research and who can serve as a means to establish credibility of a study. Having a peer debriefer look at the study provided an external check for the study that is similar to what inter-rater reliability provides for a quantitative study (Creswell, 1998).

For this study, I used Mark, a fellow doctoral student and colleague as my peer debriefer. I have known Mark for 15 years, both as a friend and colleague, and trusted that he would evaluate my findings in a fair and consistent way. Due to our long time friendship, I also believed that he would be comfortable pointing out any problems or potential pitfalls that may be contained within this study. Mark coded a sample of the data to check for inter-rater reliability for the classroom videorecordings and to provide feedback for the study.

I trained Mark to follow the protocols for determining student self-regulated behavior in the videorecordings. We practiced the procedure by looking at a videorecording that was not being used for this study and compared and discussed the things that we documented. During the discussion of our findings, we also discussed the problems I might encounter if I used only my own observations due to the fact that each of us individually missed seeing certain things on the sample videorecording.
I gave Mark the videorecordings, and we met after he had finished viewing and coding them. At this point, we found that what we were seeing was very similar. I showed Mark the general scheme that I wanted to use to categorize the data and he suggested additional descriptors for the students’ self-regulated behavior that we both agreed would increase the clarity of the results. During this study, Mark and I met six times to discuss the research and to revise and refine our interpretations of what we had seen.

Mark also served as a peer auditor. In this capacity, he helped me with assessing the accuracy of the methods, results and conclusions of this study. Simply put, I had Mark do what Creswell (1998) suggested, check to see whether or not the data I had supported the findings, interpretations and conclusions that I was making.

**Triangulation.** Creswell (1998) described triangulation as the use of multiple and different sources, methods, investigations or theories to provide collaborating evidence on a theme or perspective. Mathison (1988) described three types of triangulation involving: (a) data, where multiple data sources are used, (b) investigator, where more than one investigator is used, and (c) methodological, where multiple methods are used. For this study, I used all three types. First, I used data triangulation by combining three different data types, classroom videorecordings, researcher notes, and student surveys. Second, I used investigator triangulation by having multiple coders examine the data. Finally, I used methodological triangulation by using a mixed method design.
CHAPTER 4

Results

I divided Chapter 4 into two parts. In the first part, I present the results from my analysis of the Classroom Videorecordings. This section is divided into five sub-sections corresponding to the Five Standards. Each sub-section describes the classroom environment and the related student self-regulatory behaviors. In the second part, I describe the results from my analysis of the Student Surveys. First, I describe the reliability of five constructs, (a) Intrinsic Value, (b) Self-efficacy, (c) Test Anxiety, (d) Cognitive Strategies, and (e) Self-regulation, on the pre-test and post-test. Next, I present the results from the repeated measures ANOVAs to analyze the influences of teacher professional development and grade level for each of the five constructs. These results include the interaction effect, main effects and descriptive statistics for each construct.

Classroom Videorecordings

For this part of the study, I examined examples of low and high implementation of each of the Five Standards. I compared examples of each Standard that would tend to show the most variability with respect to the self-regulated behavior exhibited by the students. In each of the activities, I controlled for one activity per observation. Table 10 shows the BST for each observation, controlling for the total number of students, and the length of time for each activity, in minutes. In the examples presented below, the BST was higher in each of the classrooms I observed where the teacher implemented the Five Standards at a higher level.
Table 10

*Self-Regulated Behaviors per Student per Minute of Time (BST)*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Behaviors (B)</th>
<th>Students (S)</th>
<th>Time (min)</th>
<th>B/S/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPA1</td>
<td>1</td>
<td>6</td>
<td>5.45</td>
<td>0.03</td>
</tr>
<tr>
<td>JPA2</td>
<td>17</td>
<td>6</td>
<td>5.45</td>
<td>0.52</td>
</tr>
<tr>
<td>LLD1</td>
<td>1</td>
<td>11</td>
<td>3.70</td>
<td>0.02</td>
</tr>
<tr>
<td>LLD2</td>
<td>19</td>
<td>6</td>
<td>1.58</td>
<td>2.00</td>
</tr>
<tr>
<td>CTX1</td>
<td>1</td>
<td>11</td>
<td>1.60</td>
<td>0.06</td>
</tr>
<tr>
<td>CTX2</td>
<td>14</td>
<td>11</td>
<td>3.57</td>
<td>0.36</td>
</tr>
<tr>
<td>COT1</td>
<td>11</td>
<td>11</td>
<td>5.52</td>
<td>0.18</td>
</tr>
<tr>
<td>COT2</td>
<td>11</td>
<td>2</td>
<td>2.03</td>
<td>2.70</td>
</tr>
<tr>
<td>IC1</td>
<td>14</td>
<td>3</td>
<td>3.70</td>
<td>1.26</td>
</tr>
<tr>
<td>IC2</td>
<td>20</td>
<td>3</td>
<td>1.58</td>
<td>4.21</td>
</tr>
</tbody>
</table>

Self-regulated behavior in low and high examples of Joint Productive Activity.

*Low Joint Productive Activity.* The low Joint Productive Activity example involved students in the Hawaiian language class working on a sentence translation activity. Students worked in a small group writing ten sentences in their books and reading the sentences to each other. Students were instructed by the teacher prior to beginning the activity to write two ua (past tense), two ke nei (present tense), two e ana (future tense), two pepeke kauoha (“e” command sentences), and two mai (“don’t do”) sentences.
This is an example of a low Joint Productive Activity because the students were seated in a group and (a) collaborated or assisted one another, (b) were instructed in how to work in groups, and (c) contributed their individual work, not requiring collaboration, to a joint product. This example was not rated as the next higher level of implementation because it did not have (a) the teacher and students collaborating on a joint product in a whole class setting, nor did it have the students collaborating on a joint product in pairs or small groups.

The seating arrangement for the Hawaiian language classroom was comprised of five large circular tables each surrounded by five individual chairs. The tables were arranged in three rows in a 2, 2, 1 pattern when viewed from the front of the classroom. The tables were arranged to leave a large amount of space directly in the center of the classroom. This open space was used for class meetings, when a large woven mat would be placed on the ground, and teacher and students would sit on the mat and talk. The teacher’s desk was located at the near right front corner of the classroom when viewed from the front of the classroom. The teacher used a two-sided whiteboard that was affixed to a stand at the front of the room.

The teacher explained to me, in a conversation during the first day of filming, that the shape of the table was specifically chosen to represent, similar to King Arthur’s round table, that there was no one at the table who was more privileged than anyone else. The seating arrangement may seem like a small thing, but it was important for this Hawaiian language class because the teacher was trying to build a sense of community among the students by making them do certain things. For example, the teacher had the students remove their footwear before entering the main part of the classroom, as a sign of respect for
the learning environment. The teacher’s attempt at building community among the students appeared to be successful in the independent group because the students appeared to be at ease with one another while sharing their sentences.

This activity took place during a morning class in May and was part of a broader language learning exercise in which the teacher separated the class into two small groups, one that the teacher worked with on learning a new sentence structure, and the independent group described above. There were a total of 12 students in the class, seven male and four female, and an additional male student who did not turn in consent forms and was not filmed.

The students in the independent group sat at a round table located in the second row, diagonally across from, and farthest away from the table where the teacher was working with the group learning the new sentence structure. This group consisted of four male and two female students. Aside from being given instructions by the teacher at the beginning of the activity, the teacher did not help students in the independent group in any way during the time that they were working. Students in this group worked independently, but because they did not receive any corrective feedback, some errors were made in the translation of their peers’ sentences, as indicated in the example below. The students did not ask each other for help during the creation of the sentences, nor did they offer any corrective feedback when the translations were incorrect. In this example, students had limited ability to exhibit autonomous behaviors, and as such, the only self-regulated behavior exhibited involved the help-seeking behavior presented in Table 11.
Table 11

Joint Productive Activity (JPA) and Self-Regulatory Student Behaviors

<table>
<thead>
<tr>
<th>Self-Regulatory Behavior</th>
<th>Low JPA</th>
<th>High JPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Seeking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>X (lines 8,14,16, 24, &amp; 26)</td>
<td></td>
</tr>
<tr>
<td>Peer</td>
<td>X (line 3)</td>
<td>X (line 3)</td>
</tr>
<tr>
<td>Environment</td>
<td>X (lines 10 &amp; 16)</td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>X (lines 1 &amp; 5)</td>
<td></td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>X (lines 24 &amp; 26)</td>
<td></td>
</tr>
<tr>
<td>Monitoring Progress</td>
<td>X (lines 21, 23 &amp; 28)</td>
<td></td>
</tr>
<tr>
<td>Adjusting Progress</td>
<td>X (lines 24 &amp; 26)</td>
<td></td>
</tr>
</tbody>
</table>

Note. An “X” indicates the presence of a behavior. The location of where the behavior occurred within the context of the following transcribed examples is indicated within the parentheses by transcript line numbers.

1 Teacher   Why don’t you guys . . . OK, since you’re (T) finished, why don’t you read the sentences to each other. And then everyone read their sentences. So you guys have a chance, take turns. Once he’s done, (The teacher gestures to a student not yet finished with his sentences.) then read to each other. Don’t laugh too loud, OK? Try to read your sentences.
2 Student 1  OK, I can go.  
   (S1)  (Speaking to the students in the small group sitting around the table.)  
   Ke hemo nei ʻo Wela i kāna lole.  

3 Student (Translated the sentence.)  
   Group  Wela is taking off his clothes.  
   (SG)  (Laughter.)  
   Peer help-seeking behavior: S1 looks at SG, who then translates the sentence of S1.  

4 S1  Ke hele wāwae nei ke ʻanakē i kuʻu home.  

5 SG  The aunty was walking to the home.  
   (Should be: Ke hele wāwae nei ka ʻanakē i kuʻu home – the aunty is <present tense> walking to my house.)  

6 Student 2  Ua hele au i kahakai.  
   (S2)  

7 SG  You run to the beach.  
   (Should be: I went to the beach <au is “I”, hele is “went” versus holo which is “run”>.)  

8 Student 3  Ua kiʻi i ke kāne i ka maiʻa.  
   (S3)  

9 SG  The guy grabbed the banana.  
   (Should be: Ua kiʻi ke kāne i ka maiʻa –
I chose this portion of the small group sentence translation activity because it was representative of what the students in the independent group did throughout the remainder of the time they spent working together. That is, students continued to read their sentences and the peer group translated them for the remainder of the class period. The only things that changed in the portion of the transcript not included above were the sentences that the students created. The group continued to make small errors in the translations of the sentences, and there were no new categories of self-regulatory behavior. I also selected this activity based on the clarity of the audio and video recordings. The placement of the cameras, which were focused on the each of the two small group activities that were going on in the classroom, and the microphones, which were placed in the center of each of two of the tables, allowed me to record the events in each small group. This example had the clearest audio and video recordings.

**High Joint Productive Activity.** The high level Joint Productive Activity took place during the same class when the teacher and a second small group of students collaborated on a joint product. The students in this group were learning how to negate sentences which was a continuation of a previous lesson in which they learned the makemake (like or want) form. Students in this example showed more occurrences of self-regulated behavior compared to the low example of Joint Productive Activity in the areas of help seeking behavior, organization, critical thinking, and monitoring and adjusting progress as presented in Table 11.
This activity occurred during a morning class in May and the physical setting was the same as described for the Hawaiian language classroom in the low Joint Productive Activity example. However, in this example, the teacher and students were seated at the round table in the first row located nearest the teacher’s desk. There were a total of 12 students in the class, seven male and four female, and an additional male student who did not turn in the consent forms. The group with whom the teacher worked included four male and two female students.

As mentioned in the previous example, the teacher was attempting to build a sense of community among the students. In order to do this, she observed the same protocols that were expected of the students. For example, the teacher also removed her footwear while in the classroom and took a seat at the round table. Although the students showed the teacher the respect befitting her position, the teacher did not flaunt this status when dealing with the students. For example, the teacher appeared to answer all questions in a collegial way, as someone with more knowledge helping or sharing their experiences with others, rather than someone telling a less knowledgeable person what to do. The sense of community appeared to be evident in the behavior of the students who exhibited a relaxed demeanor and showed a willingness to freely offer their opinions.

1. **Group**  
   *(Students have their notebooks out and are ready to begin the lesson.)*

   **Organization:**
   
   *Students prepare for the activity by taking their*
2 Teacher (T) This is the second part. We pretty much learned this stuff. We learned makemake and then we learned iā (for passive sentences, iā is an ‘ami <object marker> for papani <pronouns> in an ‘awe <object>)
and all of those words, so we’ll put that away for a little while. So we have our sentences makemake au (“I want”).
These are just saying I like these things, she, we, like these things. What if we want to say I don’t like it?

3 Student 1 ‘A’ole. (No.)
(S1)

4 T Okay, this is called hō’ole. Hō’ole means to negate.

5 (Students write notes in their notebook.) Organization:

   Students use notebooks.

6 T To I don’t like. Okay. So we are going to hō’ole our sentences. We are going to negate them. We are not going to make
them positive. We like it. Now we’re going to say “I don’t like it”.

7 T So how we are going to do that is we are going to add ‘a’ole. Okay?

8 Student 2 In front of it? In front of the makemake? (S2)

9 T So we’re adding ‘a’ole. This is the tricky part. When your piko (subject), when your piko is a papani (pronoun) like right here,

10 (Students look at the example the teacher is writing.) Environmental help-seeking: Students refer to the example the teacher is writing.

11 T if your piko is a papani and you’re going to hō’ole your sentence, then the piko has to jump forwards, in other words. So we’re going to put ‘a’ole in front, that’s correct, okay, but because this is a papani, it needs to jump forward.

12 S2 ‘A’ole au makemake. (I don’t want.)

13 T Yup. So it ends up being . . . (Teacher
begins writing an example.)

14   S2  So it’s ‘a’ole au makemake.  

Teacher help-seeking: S2 asks the teacher a question.

15   T  ‘A’ole au makemake. Only if your piko is a papani. So all of these ‘a’ole papani makemake. Only if your piko is a papani.

16   Student 3  If it’s like this, it stays the same? 

(S3)  (S3 points to the examples of sentence cards the teacher laid out on the table.)

Teacher help-seeking: S3 asks the teacher a question.

Environmental help-seeking: S3 refers to the example the sentence card examples on the table.

17   T  So if it’s like this, a name or . . .

18   S3  It stays.

19   T  Or kikino (common noun). All you’re adding is ‘a’ole. Nothing else needs to jump. All you’re going to add is ‘a’ole. So ‘a’ole makemake ‘o Keli’i. Keli’i
doesn’t like. ‘A’ole makemake ke keiki iā ‘oe. The child doesn’t like. Only if it’s a papani it – it what – it jumps forward. ‘A’ole papani and then makemake.

Okay?

See where I’m going with this? Only if it’s a papani. So it’ll be like this: ‘a’ole au makemake. What about this one: ‘a’ole au makemake? I don’t like it. ‘A’ole ‘oe makemake. You don’t like it. Okay?

So with the sentences you wrote, okay, if they have, if the piko is a papani, I would like you . . . Well, actually all of them, the three sentences you wrote, I would like you to hōʻole. I would like you to negate the three sentences you just wrote.

(Student 4 refers to previous pages in notebook.) Monitoring progress: S4 refers to notes from a previous lesson.

Keep in mind that if it’s a papani, you need to jump forward, so look carefully at what you just wrote. So you have to
be careful about what you just wrote, yeah? Then we’ll have some sharing after.

23 (Students write the sentences. Several check their notebooks for notes written prior to today’s lesson)

Monitoring progress: Several students refer to notes from a previous lesson.

24 Student 4 So this goes before here?

(S4 compares current example to previous attempt.)

Teacher help-seeking: S4 asks the teacher a question.

Critical thinking: S4 compares the current attempt to a previous attempt.

Adjusting progress: After S4’s question, S4 attempts to confirm understanding.

25 T No, because this is . . .

26 S2 So the ‘a’ole goin’ be part of the makemake?

Teacher help-seeking: S2 asks the teacher a question.
Adjusting progress: After S4’s question and the initial negative teacher response, S2 attempts to confirm understanding.

27 T Yes, no, but for . . . Okay, good question. Thank you. I forgot to mention when you hōʻole your sentences, when you put ‘aʻole, you don’t have to circle the poʻo (verb), piko (subject), ‘awe (object).

28 (Student 4 checks notes.) Monitoring progress: After the teacher’s explanation, S4 refers to notes from a previous lesson.

29 T Only because the piko jumps into the poʻo, so you can’t really circle your poʻo anymore. You see what I’m saying? Because this is actually your poʻo right here. These two. But then you have
your piko, poʻo, ‘awe. So when you do
‘aʻole you donʻt have to circle poʻo
because it doesnʻt make sense for these
words. But if it was these, it would, but
not for these.

I chose this portion of the small group activity with the teacher as a representative sample of what the students were doing throughout the time they were working in the group because it covered the main portion of the learning activity and included the most recognizable instances of self-regulatory behavior. That is, the students exhibited well-defined examples of help seeking behavior, organization, critical thinking, and monitoring and adjusting progress. The lesson continued on with the teacher asking the students to practice what they had just learned by writing sentences in their books for the remainder of the time, and this additional event did not produce any new categories of self-regulated activities. I also selected this activity based on the clarity of the audio and video recordings. The placement of the cameras, which were focused on the each of the two small group activities that were going on in the classroom, and the microphones, which were placed in the center of each of two of the tables, allowed me to record the events in each small group. This example contained the clearest audio and video recordings of the small groups.

**Self-regulated behavior in low and high examples of Language and Literacy Development.**

**Low Language and Literacy Development.** The low Language and Literacy Development example involved students in the Hawaiian language
class being quizzed on the lei (a garland or wreath of flowers worn around the neck) words that they had learned in a previous class. Students previously participated in a lei-making lesson where they learned the vocabulary terms used in this lesson. This was an example low Language and Literacy Development because it involved significant amounts of teacher talk where the teacher explicitly modeled the appropriate language and the students engaged in a brief, repetitive, drill-like writing activity. This activity was not rated at the next higher level of implementation because the teacher did not provide students with structured opportunities for academic language development in sustained reading, writing or speaking activities.

The physical setting for this activity was the Hawaiian language classroom described in the two Joint Productive Activity examples. This example occurred during a morning class in May. However, in this example, students sat at each of the five large round tables, but were not members of a particular group. There were a total of 12 students in the class, seven male and four female, and an additional male student who did not turn in the consent forms.

As previously mentioned in the low Joint Productive Activity example, the five tables were arranged in three rows in a 2, 2, 1 pattern when viewed from the front of the classroom. In the first row, two male and one female student occupied the table nearest the teacher’s desk and one male and one female student occupied the table adjacent to it. In the second row, there were two male students and one female student on each of the two tables. The final table in the third row was where the teacher placed the student who did not sign the release forms so that the cameras did not record his activities. The camaraderie that was
evident in the group activities of the previous example was not observed because
the students were taking a quiz on previously learned material and no talking
was allowed. The teacher, standing at the front of the room, read the questions
to the students. In this exchange, students had limited ability to exhibit
autonomous behaviors, and as such, the only self-regulated behavior exhibited
involved the help-seeking behavior presented in Table 12.

1 Teacher  Okay, so this is kuisa iwakaluakūmāwalu
(T) (Quiz 28).

So all the lei words, the ones we did last
week when we did the lei, remember?
Mākaukau (ready)?
So there’s ten huaʻōlelo (words), so all the
lei words. First five I’m going to give you
the Hawaiian, you write it in English; the
next five I’m going to give to you in
English, you give me the Hawaiian.

2 T Helu ʻekahi (Number one): Ka pua
kalaunū (crown flower). Ka pua kalaunū.

3 (Students write.)

4 T Helu ʻelua (Number two): Ke kui
(needle). Ke kui.

5 (Students write.)

6 T Helu ʻekolu (Number three): ʻEkolu is kui
(to string). Gotta listen carefully. Helu
ʻelua is “ke kui”, that’s the kikino (common noun). Helu ʻekolu is “kui”, the painu (verb). Got it?

(Students write.)

8 T Helu ʻehā (Number four): Wili (to wrap or twist). Wili.
(Students write.)

9 T Helu ʻelima (Number five): Ka lei ʻāʻī (neck lei). Ka lei ʻāʻī.
(Students write.)

10 T Helu ʻeono (Number six): Plumeria (a type of flower). Plumeria. Make sure you get your kaʻi (noun marker) now.

Your “ka (the)” and your “ke (the)”.
(Students write.)

11 T Helu ʻehiku (Number seven): String.
(Students write.)

12 T Helu ʻewalu (number eight): ʻEwalu is “to braid”. ʻEwalu is “to braid”.
(Students write.)

13 T ʻEiwa (Nine): Is to twist or to wind. No use the same word as number four, yeah.

There’s two words that mean the same thing, right? Gotta use the other one.
(Students write.)

T And Helu ‘umi (Number ten) is “ti leaf”.
You should all know that one, yeah.
That’s the name of your papa (class).
Correct? Right? You should all spell that properly.

(Students write.)

T Okay, when you pau (finished), I’ll collect it. Anything I have to repeat?
Number eight is “to braid”.

Student What was four?  
1(S1)

Teacher help-seeking: S1 asks the teacher a question.

T Number four was wili, so you cannot use that one at the end.
There were two words that were the same.
Anybody else? Anybody else?
Okay pass around the tape to tape in your other kuisa.
So what I’m gonna do now, I’m gonna correct your kuisa. Can you guys go ahead and write this down? The papa kuhikihi (schedule or program) for today so your table will have this: Kuisa (quiz),
ʻŌlelo Noʻeau (proverbs), Huaʻōlelo Hou (vocabulary), and your new haʻawina (homework or lesson), which is “makemake (like or want).” Then go ahead and write your ʻōle noʻeau for this week too.

This representative sample included the entire quiz taking activity. I chose this example because it was part of a typical sequence of events in the lessons that the teacher created for the class. Specifically, as students began a new unit, they would learn new words, be quizzed on them, then additional lessons or projects would be assigned to help the students understand the words in context. This lesson exhibited a high amount of language and provided students with a familiar context, the important cultural tradition of lei making and lei giving. I also selected this activity based on the clarity of the audio and video recordings. The placement of the cameras, which were focused on a wide view of the classroom from the back to the front, and the microphones, which were placed in the center of two of the tables, allowed me to record the events in the classroom. This example contained the clearest audio and video recordings.
Table 12

Language and Literacy Development (LLD) and Self-Regulatory Student Behaviors

<table>
<thead>
<tr>
<th>Self-Regulatory Behavior</th>
<th>Low LLD</th>
<th>High LLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Seeking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>X (line 23)</td>
<td>X (lines 6, 8 &amp; 74)</td>
</tr>
<tr>
<td>Environment</td>
<td>X (lines 4, 42 &amp; 54)</td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>X (lines (1, 3, 13, 41 &amp; 71)</td>
<td></td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>X (lines 6 &amp; 31)</td>
<td></td>
</tr>
<tr>
<td>Monitoring Progress</td>
<td>X (lines 23, 58, &amp; 73)</td>
<td></td>
</tr>
<tr>
<td>Adjusting Progress</td>
<td>X (line 58)</td>
<td></td>
</tr>
<tr>
<td>Self-Evaluation</td>
<td>X (lines 18 &amp; 23)</td>
<td></td>
</tr>
</tbody>
</table>

Note. An “X” indicates the presence of a behavior. The location of where the behavior occurred within the context of the following transcribed examples is indicated within the parentheses by transcript line numbers.

High Language and Literacy Development. The high Language and Literacy Development example also came from the Hawaiian language classroom and involved students learning a new sentence structure.

This activity occurred during a morning class in May in the Hawaiian language classroom described in the Joint Productive Activity examples. However, in this example, the teacher and students were seated at the round table located nearest to the teacher’s desk. There were a total of 12 students in the class, seven male and four female, and an additional male student who did not turn in the consent forms. The group with whom the teacher worked included four male and two female students. Students were respectful of the
teacher and their peers during each of the classes that I visited. The teacher conducted the discussions in what appeared to be a knowledge sharing exercise, where opinions and questions were welcomed, rather than a top-down teaching exercise where the teacher exhibited total control over the process.

Students in this example worked with the teacher on learning a new sentence structure that was the makemake form, which denoted “I like” or “I want.” In previous class periods, the students learned the basic poʻo (verb), piko (subject) and ʻawe (object) sentence structure, and this lesson was an extension of that material. Because the lesson was relatively new to the students, the teacher used a set of flashcards to physically show how the verbs, subjects, and objects were placed in each sentence. The teacher moved the cards, emphasizing important points for the students, for each of the sentences that were used.

This was an example of high Language and Literacy Development because the teacher designed and enacted an instructional activity that generated language expression and the development of content vocabulary, and assisted student language use and literacy development through questioning, rephrasing, or modeling. Students in this example showed more occurrences of self-regulated behavior when compared to the low example of Language and Literacy Development in the areas of help seeking, organization, critical thinking, monitoring and adjusting progress and self-evaluation as presented in Table 12.

1 Group (Students have notebooks out and are ready to begin the lesson).

Organization:

Students prepare for the activity by taking their
2 Teacher (T) We’re going to do a new sentence project. So let’s start with the basics, right. Poʻo – verb. Piko – subject. ‘Awe – object. Today’s new one is called makemake.

3 Group (Students write in their notebooks). Organization:
Students write important information in their notebooks.

4 Student 1 (Looks at the poʻo, piko, ‘awe sentence structure cards the teacher laid out on the table then begins work). Environmental help-seeking: S1 refers to the sentence structure card examples on the table.

5 T Makemake is a painu (verb), so we’re actually, what we’re doing is learning a different painu.

6 Student 2 Like the last time? The other one? Teacher help-seeking: S4 asks the teacher a question. Critical thinking: S2 compares the
current attempt to a previous attempt.

7 T There’s no tense like in the other one. So this one, the painu, just like ‘ai (to eat), is makemake. So this is going to set up the whole structure. All you’re doing is doing makemake.

8 S2 So makemake is going to be your first one? Teacher help-seeking: S2 asks the teacher a question.

9 T Makemake is your painu. So this is going to be with your . . . (Teacher works with S2.)

Makemake means . . .

10 S2 Like.

11 T Like or want.

12 S2 Like or want.

13 Group (Students write in notebooks.) Organization: Students write important information in their notebooks.

14 T So this is the structure. You can tell me I like this or I like that or I want this, yeah.
So very basic. Write it on the paper.

15 T Going to give you examples. If you have the poʻo, piko, ʻawe cards you should get this. All we’re actually doing is changing the painu to makemake. So let’s try this. Makemake au i ka poke.

16 Student 3 I want.

(S3)

17 T Makemake au – I want or I like poke (an appetizer or snack, usually made with raw fish).

(The teacher points at each word as she says them.)

Very easy, yeah? As long as you got the structure down.

18 Student 4 Pretty good.

(S4)

Self-evaluation: S4 appears to make a self-evaluation based on understanding.

19 T Yeah, pretty easy, yeah? As long as you got this part.

20 T (Writing a sentence.)

Makemake ʻo Keliʻi i ka maiʻa.
21  Student 5  Keli‘i wants bananas.
     (S5)
22          T  Keli‘i wants or likes bananas.
23          S5  (Nods)  
              Self-evaluation: S5 appears to make a self-evaluation based on understanding.
              Monitoring progress: S5 appears to indicate understanding.
24          T  Next example I’m going to give you, I’m going to throw you a little curveball and see if you can figure it out. Look at this one: Makemake ke keiki ia‘oe. (The child wants you.)
25          S5  The child . . .
26          S2  The kid . . .
27          T  The child wants . . .
28  Student 6  You.  
     (S6)
29          T  What did you say?  
     (Pointing at the student.)
You. How do you know its “you”?  

S5 Iā ‘oe.  

Critical thinking:  
S4 appears to think about the teacher’s question before answering.  

T Iā ‘oe is “you,” right? So the child wants you.  

Here is the second new part, okay. So the child wants you. Iā ‘oe. We learned earlier that we need an ‘ami (object marker) for our ‘awe (object), correct?  

S5 (Nods)  

T We always need an ‘ami. There a lot of different ‘amis depending on what our ‘awe is, okay. So we only learned kahi kikino (a common noun) when it’s a noun we use ‘awe. Now, what kind of part of speech is ‘oe (you)?  

S1 Noun.  

T Okay, yeah, but this is a noun, but what kind of part of speech is ‘oe? ‘Oe is a . . .  

S5 Papani.
Papani. Remember the chart that said ‘oe (you), au (I or me), ‘o ia (he, she or it), lāua (they, for two people), lākou (they, for three or more people), mākou (us, for three or more people, exclusive), kākou (us, for three or more people, inclusive) is papanis.

Okay, papanis. Anytime you put a papani in your ‘awe, you need to put this marker. (Shows students how to do it). Okay, which is “ia”, this is your ‘ami marker. So it’s (unintelligible, most likely “i”) for kikino and iā for papani. Go ahead and fill in a little bit and I’ll move on to the next one.

Organization:
Students write important information in their notebooks.
So as you noticed already, you put you in the object form. So “you” in ‘awe is iā ‘oe. What is “you” in the piko form here?

ʻoe.

Does it have anything in front of it?

(Shakes head side to side indicating “no”).

‘A’ole, right.

So this is piko. This is ‘awe. (Pointing to the written example.)

So in our piko, its just au, ‘oe and ‘o ia (I, you, he or she). In your ‘awe this is how it is because we have to add iā plus ‘oe.

So these are your three new ones in your ‘awe form.

(Puts the example in the middle of the table.)

So in the same pronoun, it’s the same papani (pronoun), but because it’s in a different part of the sentences it needs different markers.
Okay? Because when we’re piko, they’re au, ‘oe, ‘o ia (you, me, him and her).

There’s no ‘ami, but when we do it in ‘awe we need an ‘ami and the ‘ami is different.

I’m gonna let you guys soak that in a little. We’ll just stick to these three papani because remember the chart?

There’s a bunch of papanis. We’ll just stick to these three.

Do you see you can still use au, ‘oe, and ‘o ia in ‘awe form?

Okay, now let me ask you this now.

Okay. We do these in piko form. This is I, you, he or she. (Points to the example).

What is it in ‘awe form?

48  S5  It’s “me.”

49  T  What is ia‘u in ‘awe form? Which is me.

   So this (points at the example) is you.

   What is iā ia?

50  S5  Them.

51  T  Remember this. He or she. So what is iā ia?

52  S6  Him or her.
Him or her, yeah, so this is me, you, him or her. And then it will make more sense when we put it in the structure.

Group (Students look at the example in the middle of the table.)

Environmental help-seeking:

Students refer to the in the middle of the table.

So iaʻu is “me”, iāʻoe is “you”, iā ia is “him or her.” So you got that part? Now I want to show you more examples of the structure so it will make more sense.

Here, how about this one: Makemake au iāʻoe. (I want you or I like you.)

I want.

I . . . (points to the example) like . . .

You. Like you. Monitoring progress: S5 appears to realize by the teacher’s action that the previous statement was not entirely correct.
Adjusting progress

S5 makes another attempt.


60    S4  Gonna say that one tonight, then.

61    Group  (Students laugh)

62    T  Try this one: Makemake ‘oe iā Keli‘i.
      (You like Keli‘i.)

63    S5  You like Keli‘i.

64    T  Makemake ‘oe, you like . . . Who?

65    S5  Keli‘i.

66    T  Keli‘i. So what do you notice about this?
      When it’s a person’s name, all you have to do is add . . .

67    S5  Ia.

68    T  . . . iā (pointing to example on the table).
      This is only makemake form. Makemake ‘oe iā Keli‘i, You like Keli‘i.
      How about his one: Makemake ‘o Pua iā ia. (Pua likes him or her.) Makemake ‘o Pua iā ia. So, Pua likes . . ?

69    S5  Him.

70    T  Him or her. Iā ia is him or her. Okay.
See where I’m going with this? Now you getting it?

What I would like you to do is in your puke (notebook) for your ha’awina (homework), I want you to write three makemake sentences. Okay? And once you’re finished with that there is a second part that I’m going to teach you too, but first write all the sentences and we’re going to use it in the second part.

71 Group (Students write sentences.) Organization:

Students write important information in their notebooks.

72 T And I’ll leave this for examples. (Places a written example in center of round table.)

73 S1 (Opens notebook and reviews a previous lesson.) Monitoring progress: S1 checks previous work.

74 S1 “I” is au, yeah? Teacher help-seeking: S1 asks the teacher a question.
I chose this portion of the small group activity with the teacher as a representative sample of what the students were doing throughout the time they were working in the group because it covered the main portion of the learning activity and included the most recognizable instances of self-regulatory behavior. For the remainder of the time, the teacher asked the students to practice what they had just learned by writing sentences in their books, and this did not produce any additional self-regulated behaviors. I also selected this activity based on the clarity of the audio and video recordings. The placement of the cameras, which were focused on the each of the two small group activities that were going on in the classroom, and the microphones, which were placed in the center of each of two of the tables, allowed me to record the events in each small group. This example contained the clearest audio and video of the small groups.

Self-regulated behavior in low and high examples of Contextualization.

Low Contextualization. The low Contextualization example involved students expanding on the “lei” theme of previous classes. Students were given an ʻōlelo noʻeau (traditional proverb) and discussed its literal translation and deeper meaning. This was a low level example of Contextualization because the teacher included an aspect of students’ everyday experience in the instruction and connected the classroom activities by building on the current unit of instruction. This example was not rated at the next higher level of implementation because the teacher did not make incidental connections between the new activity or information and students’ prior experiences or knowledge from home, school, or community.
This activity occurred during a morning class in May, and the physical setting was the same as described for the Hawaiian language classroom in the low Language and Literacy Development example, such that students were seated at each of the five large round tables, but were not members of a particular group. Based on my observations of this class, this arrangement appeared to be the classroom seating arrangement, when students listened to lectures, took quizzes, and completed individual projects. This contrasted the seating arrangement that was designed for group activity. In this latter case, the students were divided into two groups and sat at tables diagonally across from one another.

There were a total of 12 students in the class that day, seven male and four female, and an additional male student who did not turn in the consent forms. The camaraderie that was evident in the group activities was not observed in this example because the students were listening to a mini-lecture about the ‘ōlelo no‘eau (proverb) of the day, including its importance. The teacher, standing at the front of the room, gave the mini-lecture and asked the students questions. In this exchange, students had limited ability to exhibit autonomous behaviors, and as such, the only self-regulated behavior exhibited involved the help-seeking behavior presented in Table 13.

1. Teacher: Okay, so everybody went write their ‘ōlelo no‘eau (proverb) down? 
   (T) ‘Ae (yes), ‘a‘ole (no)? You guys writing
   ‘em down now? So while you guys
   writing it down, I’m going to go over it
real quick.
Okay, so we’re gonna stick with the lei theme that we’ve had this month. Like how the last week we had the one talking about the lei, the needle and the string, the flowers . . . So this one, um, is about leis again.
So this one is: “E lei kau, e lei ho‘oilo i ke aloha.” (Love is worn like a lei through the summers and the winters.)
Helu ‘ekolu - ‘ekolu o elua ma ka puke ‘ōlelo no‘eau. (Number 332 in the book, ‘Ôlelo No‘eau.)
Okay, the literal translation for this ‘ōlelo ne‘eau is: “Love is worn like a lei through the summers and the winters.” So love is worn like a lei through the summers and the winters. Just by that sentence, what do you think the kaona (deeper meaning) is?
What is the deeper meaning?

2 Student  Love lasts forever?

(S)

3 T  Love lasts forever. Why does it last
forever? Because what?

Cause you can wear it all the time, right?

So what Keoni just said is correct. The kaona/deeper meaning of this ‘ōlelo no‘eau is: Love is everlasting.

You can wear it during the summer. You can wear it during the winter. It doesn’t matter, yeah? Wear it all year round. So love is everlasting.

This representative sample included the entire ‘ōlelo no‘eau (proverb) activity. I chose this example because it showed the teacher’s attempt to show the students the contextual relevance of the previously learned material described in the low Language and Literacy development example. This lesson used ‘ōlelo no‘eau (proverbs), which are important aspects of Hawaiian culture. These proverbs were passed down through many generations through oral history from elders to children with the hopes that the wisdom contained within them would be of value to future generations. A comparable American equivalent would be a saying like “Never leave that till tomorrow which you can do today” which Benjamin Franklin wrote in Poor Richard’s Almanac. I also selected this activity based on the clarity of the audio and video recordings. The placement of the cameras, which were focused on a wide view of the classroom from the back to the front, and the microphones, which were placed in the center of two of the tables, allowed me to record the events in the classroom. This example contained the clearest audio and video recordings.
Table 13

*Contextualization (CTX) and Self-Regulatory Student Behaviors*

<table>
<thead>
<tr>
<th>Self-Regulatory Behavior</th>
<th>Low CTX</th>
<th>High CTX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Seeking</td>
<td>Teacher</td>
<td>X (line 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X (lines 5, 25 &amp; 31)</td>
</tr>
<tr>
<td>Organization</td>
<td></td>
<td>X (lines 1 &amp; 12)</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td></td>
<td>X (lines 16, 22 &amp; 25)</td>
</tr>
<tr>
<td>Monitoring Progress</td>
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</tr>
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<td>X (line 33)</td>
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<tr>
<td>Self-Evaluation</td>
<td></td>
<td>X (lines 18, 20 &amp; 24)</td>
</tr>
</tbody>
</table>

*Note.* An “X” indicates the presence of a behavior. The location of where the behavior occurred within the context of the following transcribed examples is indicated within the parentheses by transcript line numbers.

**High Contextualization.** The high Contextualization example involved students learning new vocabulary words.

This activity occurred during a morning class in May, and the physical setting was the same as described for the Hawaiian language classroom in the low Contextualization example where students were seated at each of the five round tables, but were not members of a particular group. There were a total of 12 students in the class, seven male and four female, and an additional male student who did not turn in the consent forms. Students in this activity exhibited some of the camaraderie that was evident in other group activities, as the students exhibited a relaxed demeanor during the lesson, readily asked questions when they had one, and freely shared their opinions and comments with one another. This may have been because the teacher appeared to conduct the lesson
as a knowledge sharing exercise, where opinions, questions and comments were welcomed, rather than a top-down teaching exercise where the teacher exhibited total control over the process.

The teacher asked the students to choose five words that they wanted to learn and which would be unique to their class. After the students chose the words, the teacher, standing at the front of the room, wrote the words on the board, asked the students questions, and gave the students suggestions about how to remember the Hawaiian translations. This was an example of high level Contextualization because the teacher integrated the information with what students already knew from home, school, or community. Students in this example showed more occurrences of self-regulated behavior when compared to the low level example of Contextualization in the areas of organization, critical thinking, monitoring and adjusting progress and self-evaluation as presented in Table 13.

1. **Group** (Students have notebooks out and are ready to begin the day’s lesson)  
   **Organization:**  
   Students prepare for the activity by getting their notebooks out.

2. **T** So these are the five I chose that I think you guys should know for this school year and the next five is what do you guys think.  
   (Points to words written on the board.)
So if you look at these, what kind of words are these? Are they all painu (verbs) or kikino (common nouns)?

3 Student 1 Painu.

(S1)

4 T Painu. And no more ka‘i (noun marker).

So these are all painu. Okay, there’s five other words. It doesn’t have to be a painu, it can be a kikino also.

What five words do you want to learn that you haven’t learned already?

5 Student 2 So we have to make them all painu? 

(S2)

Teacher help-seeking: S2 asks the teacher a question.

6 T No, it can be either painu or kikino.

(Students refer to their notebooks and consult with each other.)

7 (Students choose the words volleyball, singing, circle, camera, and phone).

8 (Teacher and students review the first five words, and then proceed to the students’ choices).

9 T OK, here are the words you wanted.

Volleyball. Po pai lima (saying the
words and writing them on the board at the same time)

11 Student 3 Whoa. (S3)

12 Group (Students write in notebooks.) Organization:
Students use notebooks.

13 Student 4 Who chose that? (S4)

14 S3 It’s a long word.

15 T It’s a long word, but look at this. Here,
I’ll help you remember it.

(Writes the word on the board and points out each part of the word to the students.)
Pō is ball. Paʻi is to slap. Lima is . . .

16 S1 Hand. Critical thinking:
S1 considers for a moment, then answers.

17 T . . . hand. So this is the ball that you slap with your hand. What is it?

18 Student 5 No way. Self-evaluation: S5 appears to make a
T I’m serious. That’s all it is.

S2 Whoa, that was pretty killaz.

Self-evaluation: S2 appears to make a self-evaluation indicating understanding and disbelief.

T Because didn’t we already have pa’i as a word?

S4 Yeah.

Critical thinking: S4 thinks for a moment, then answers.

T To slap. So the ball that you slap with your hand.

S5 Whoa. That’s smooth.

Self-evaluation: S5 appears to make a self-evaluation indicating understanding and
Did you just make that up?

(s6)

Teacher help-seeking: S6 asks the teacher a question.

Critical thinking:
S6 appears to indicate understanding but also the belief that it cannot be as simple as the teacher’s explanation.

No, I didn’t just make it up.
Okay, sing or singing is another painu.
Hīmeni. Hīmeni. To sing, hīmeni.
Okay, circle. Lani wanted circle because we always sit on circle tables. Okay.
Circle, “ka pō‘ai.” We don’t sit on rectangular tables, yeah? Ka pō‘ai.
Okay, camera I think is three words.

Whoa. Who said camera?

These are good words. (Starts writing on the board.)
board.)

Pa‘i. Slap. Grab.

progress: S1 responds to what the teacher is writing on the board.

30 T Wait. I gotta erase this. It’s one word.

One whole word.

Okay, so this is how you remember this one. Pahu is box. Pa‘i isn’t the same as this one.

(Pointing to the volleyball example.)

This pa‘i is to take the picture. And then ki‘i is the picture. The box that takes the picture. Yeah. Because ki‘i is picture also, yea. The box that takes pictures.

31 S4 I thought ki‘i means grab? Teacher help-seeking: S4 asks the teacher a question.

Monitoring progress: S4 appears confused because the students had apparently learned
the word before, but

with another
definition.

32 T No, kiʻi means grab, but this is a different one. This is a . . .
kikino. Okay, and we have telephone.
Kele-pona. Sounds just like telephona,
yeah? That’s how you can remember it,
yeah. Okay, so these huaʻōlelo (vocabulary) are for today, these are your words and your words only. Because no other class is going to have the same words as you except for the top part. Yeah, cause the first period did their own, you guys did your own. Everybody is doing their own.

33 S4 (Nods) Adjusting progress:
S4 appears to indicate understanding.

I chose this portion of the vocabulary activity as representative sample of what the students were doing because it covered the portion of the learning activity that the teacher and students spent the most time on, gave the students the most opportunity for choice, and included the most recognizable instances of
self-regulatory behavior. I also selected this activity based on the clarity of the audio and video recordings. The placement of the cameras, which were focused on a wide view of the classroom from the back to the front, and the microphones, which were placed in the center of two of the tables, allowed me to record the events in the classroom. This example contained the clearest audio and video recordings.

**Self-regulated behavior in low and high examples of Complex Thinking.**

**Low Complex Thinking.** The low Complex Thinking example involved students who were preparing to conduct a laboratory experiment in the science class. The science classroom was divided into a classroom area and a laboratory area. The classroom area was located closest to the single entryway and took up roughly half of the overall classroom space. Viewed from the front of the room, one-piece student desks were arranged in six rows of four seats, with one additional seat placed behind each of the last seats in the middle two rows. Three sliding whiteboards were mounted to the front wall of the classroom, and a large black-topped rectangular teacher demonstration table was located between the student desks and the white boards. When viewed from the front of the classroom, the teacher’s desk was located on the left side of the demonstration table. The arrangement of the laboratory area is described later in the high Complex Thinking section.

This activity took place during a morning class in August. There were a total of 11 students in the class, seven female and four male. Students in this example sat at the individual, one-piece student desks facing the front of the classroom. The teacher stood in front of the rectangular demonstration table.
Various pieces of lab equipment were placed on the demonstration table, including a measuring scale, beaker, flask, rubber stopper, weighing paper, and measuring tray. The procedure for the day’s lab activity was written on one of the whiteboards, located on the wall at the front of the class. The discussion that followed was part of the pre-lab preparation used by the teacher to determine the level of prior knowledge the students possessed and to determine how well they understood the procedure for the day’s laboratory experiment.

The day’s laboratory activity required students to test whether or not mass changed when salt was dissolved in water. This was the first time students had dealt with this problem. Students were asked several questions regarding the weighing procedures and also questions about what they predicted would happen in the upcoming experiment. This was an example of low level Complex Thinking because the teacher connected student comments to content concepts and provided students with feedback on their performance. This example was not rated at the next highest level of implementation because the teacher did not design or enact activities that connected the instructional elements to academic content and did not advance student understanding to more complex levels. In this exchange, students had limited ability to exhibit autonomous behaviors, and as such, the only self-regulated behavior exhibited involved critical thinking as presented in Table 14.

1 T Water does have mass right?

2 Student 1 Mmm hmm.
   (S1)

3 T Is water made of particles?
4 Student 2 Yeah.  

(S2)

5 T So it has mass.  
Okay. Uh. And in here I’ve got some salt  
(Picks up measuring tray with salt in it.)  
in this tray. If I put it on here,  
(Puts the tray on a scale.)  
I will find its . . .

6 S1 Mass.  

Critical thinking:  
S1 pauses briefly  
before answering,  
appearing to  
consider the new situation.

7 T Mass.

8 T What if I put the two together like this?  
(Puts the beaker on top of the measuring tray.)  
What am I measuring?

9 S1 Both.  

Critical thinking:  
S1 pauses briefly  
before answering,  
appearing to apply
10  Student 3  All.  
(S3)  

11  The mass of everything.  Right?  
Does it make a difference whether I do it  
like this  
(Moves the tray around.)  
or do it like this?  
(Puts the tray on beaker.)  

12  Student 4  No.  
(S4)  

13  T  I’m still finding the mass, right?
The total mass of everything. Is that correct?

14 S1 Yeah.  

Critical thinking:  
S1 pauses briefly before answering.

15 T What happens if I pour the salt into the water? And then the salt dissolves in the water. And then I put it back on the tray. What am I going to measure? Will the mass . . . Will I still have the mass of everything and will it be the same, or will it be less, because the salt is now dissolved?

16 S3 Be less.  

Critical thinking:  
S3 pauses briefly before answering, appearing to consider the parameters of the new situation.

17 T Hmm. Think for a second and write your answer down in your notes. When you dissolve the salt in the water, will the mass . . .
The mass will either stay the same, or get less, or will increase.

Do you have something to write with?

OK.

So, you’re writing down that mass will either increase,
decrease, or remain the same when you dissolve the salt in the water.

18 T (Walks over to a student without a lab book on the desk and helps the student find and take out the lab book)

19 T Alright, how many, just a show of hands. We’re not going to talk about right or wrong here. How many think the mass will be greater?

(No hands raised.)

Nobody. How many think that the mass will be the same?

(Counting the number of raised hands.)

One, two, three – ooo, about half of you. And then again, so I can assume that the rest of you think that the mass will be less. Is that correct?

20 S3 (Nods.)
OK. Alright. So that is one of the activities that you are going to do. I will quickly go over the lab format for you so that you know how to do that. But before I do that I’m going to ask the second question.

In the second question, I got water again, just like last time. Except that I take the stopper off. And I’ve got Alka Seltzer. You all know what Alka Seltzer is, right. So I put these two on here (picks up two Alka Seltzer tablets) and I find the total mass of everything, right. I then put the Alka Seltzer in the water. What’s going to happen?

It dissolves.

Critical thinking:
S1 pauses briefly before answering, appearing to apply previous knowledge to the new situation.

It’s going to dissolve.

And will it dissolve the same way that
the salt did?

25  S1  No.  

Critical thinking:  
S1 applies previous knowledge to the new situation.

26  T  What else will happen? There’s going to be some . . .

27  S1  Bubbles.  

Critical thinking:  
S1 applies previous knowledge to the new situation.

28  T  Some bubbling, right? There’s going to be some bubbling. What does the bubbling mean? What’s happening?

29  S1  Chemical reaction.  

Critical thinking:  
S1 pauses briefly and uses a term not previously referred to in the lesson.

30  T  OK. That’s a fancy word, chemical reaction, we haven’t talked about, but, you can use that term, but, uh, try to use vocabulary that we’ve actually talked
about in the class that maybe everybody understands, OK. So we haven’t discussed chemical reactions yet. That’s kind of a fancy word, alright. But obviously, something’s happening, right. Ok, we’ve got some bubbling going on and the bubbling represents . . .

31  S1  Particles.  

Critical thinking:  
S1 pauses briefly and uses a term introduced at the beginning of the lesson.

32  T  Particles, OK. What kind of particles, maybe? Any idea?

33  Group  (Silence.)

34  T  OK, that’s alright, we’ll just leave it at that, we’re at the beginning stages of our learning here. So once the Alka Seltzer is dissolved, I ask you the same question I asked a minute ago: Will the mass be the same, different, uh, less or greater? So write that in your notes. When the Alka Seltzer dissolves,
the mass will be either greater, less or the same.

I chose this portion of the laboratory experiment a representative sample of what the students were doing during their laboratory experiments because it covered the entire pre-lab portion of the learning activity. Each of the laboratory experiments that I observed began with a pre-lab session where the teacher would demonstrate how to use any equipment that was required in the experiment and expose the students to the content and concepts related to the experiment. I also selected this activity based on the clarity of the audio and video recordings. Two cameras were used, one of which was focused on a wide view of the classroom from the back to the front, and the other focused on a wide view of the classroom from front to back. This example contained the clearest audio and video recordings.
Table 14

*Complex Thinking (COT) and Self-Regulatory Student Behaviors*

<table>
<thead>
<tr>
<th>Self-Regulatory Behavior</th>
<th>Low COT</th>
<th>High COT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Seeking</td>
<td>Teacher X (lines 2 &amp; 4)</td>
<td>Peer X (line 24)</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>X (lines 6, 9, 10, 12, 14, 16, 23, 25, 27, 29, &amp; 31)</td>
<td>X (lines 2 &amp; 4)</td>
</tr>
<tr>
<td>Monitoring Progress</td>
<td>X (lines 10 &amp; 24)</td>
<td></td>
</tr>
<tr>
<td>Adjusting Progress</td>
<td>X (lines 9, 12, 16 &amp; 20)</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* An “X” indicates the presence of a behavior. The location of where the behavior occurred within the context of the following transcribed examples is indicated within the parentheses by transcript line numbers.

**High Complex Thinking.** The high Complex Thinking example involved students who were learning how to correctly use a triple-beam balance.

The physical setting for this example was the science classroom described in the low Complex Thinking example, except that the students were now working in laboratory area. This activity also took place during a morning class in August. There were a total of 11 students in the class, seven female and four male. Prior to the laboratory activity, the teacher asked the students to self-select their laboratory groups, with each group having no more than three members. The students chose to divide into four groups, one group with two female members, two groups with two female members and one male member, and the final group with two male members and one female member.
The laboratory area, located in the back half of the classroom, contained a total of seven black-topped, pentagon-shaped lab tables. Space in this area was limited due to the placement of a large fume hood in the center of the classroom. Each lab table was affixed to the counter running the entire length of the wall. Three lab tables were located along the back wall of the classroom and two other tables were located on the adjacent wall on the entryway side of the classroom. Each lab table had a roughly 10” x 10” hole in the center of the work area that functioned as a sink. Two faucets were located on opposite sides of the sink.

Four lab tables were used in the day’s activity, the three along the back wall of the classroom and the lab table along the adjacent wall farthest away from the entryway. All students were wearing goggles and lab aprons, as required by the teacher. Various pieces of lab equipment were placed on the lab table, including a triple beam balance, flask, stopper, and weighing tray. The procedure for the day’s lab activity was written on one of the whiteboards, located on the wall at the front of the class. Students were tasked with learning how to use the triple beam balance by weighing the flask and the various materials provided by the teacher. The lab group that I observed was made up of the two female students who were standing at the lab table located diagonally across from, and farthest away from the entryway, on the far left side if viewed from the front of the classroom. This was the first time that the students had worked with a triple-beam balance. The discussion that followed was part of the lab group’s attempt to learn how to use the triple beam balance correctly.

This was high-level Complex Thinking because the teacher (a) assisted students’ Complex Thinking by demonstrating the procedure and asking the students questions to determine the students’ level of understanding, (b)
designed and enacted challenging activities with clear standards and performance feedback, and (c) assisted the development of more complex thinking. Students in this example showed more occurrences of self-regulated behavior compared to the low-level example of Complex Thinking in the areas of help seeking from both teacher and peers and monitoring and adjusting progress as presented in Table 14.

1  Teacher (T)  So what, uh, what are you going to do?

   This measuring?

   (The teacher is at a lab station with two students working to measure the initial weight of the flask and the materials used in the experiment)

2  Student 1  Mass?

   (S1)

3  T  When you’re measuring mass, the mass here, what are you measuring? What units? Millimeters. Grams? Or inches?

   Teacher help-seeking: S1 asks the teacher a question.

   Critical thinking: S1 pauses briefly before answering, appearing to apply previous knowledge to the new situation.
S1: I think grams.

Teacher help-seeking: S1’s answer did not appear to be a confident one, and the student appears to be asking for teacher confirmation. Critical thinking: S1 pauses briefly before answering, appearing to apply previous knowledge to the new situation.

T: So it says grams right there, okay. (Pointing to the numbers on the beam.) Alright?

S1: Okay.

T: So we always measure mass in grams. OK? (Points to numbers on the balance.)

T: Remember, always remember now that these (Points to riders on the beam.) need to be in the little locks – the holes.
(Shows students the correct placement of the riders on the beams.)

9  Group  (Students try to make the adjustment.)  Adjusting Progress:
     (S1 & S2)  As S1 & S2 did not previously have all riders correctly locked in, they now attempt to replicate what the teacher demonstrated.

10  S2  See, keep going until it, yeah, OK now back up.  Monitoring Progress: S2 makes these suggestions while S1 physically moves the rider.
     (While S1 is moving the rider.)

11  T  Now move the next one – you’ll have to pick it up. Yeah there you go. There you go.

12  S1  (Moves rider along the beam.)  Adjusting Progress:
     S1 listens to the teacher’s feedback and attempts to move the rider in the suggested manner.
13  T  Not enough.

14  S1  (Giggles.)

15  T  Yeah. Now you’re getting it.
    OK. So 60 is too much.

16  S1  (Student moves rider back.)  Adjusting Progress:
    S1 listens to the
    teacher’s feedback
    and attempts to
    move the rider to a
    lower number.

17  T  OK. Alright.
    No, no. It has to be in the little notch.
    (Moves to show student where the rider
    needs to be placed and bumps a flask on
    the table, almost knocking it into the
    sink.)

18  S1  Ooo, mister.

19  T  Has to be in the little notch.
    OK. Now you move the little one.

20  S1  (Student moves the tenth of a gram weight.)  Adjusting Progress:
    There.
    S1 listens to the
    teacher’s feedback
    and attempts to
    move the rider in the
OK, so what does that read out now?

What does that read?

S2 Hundred fifty-one.

T Almost.

S1 One hundred fifty seven point one.

Monitoring
Progress: S1 listens to the teacher’s feedback about S2’s attempt at identifying the weight of the object. Upon hearing that it is not quite correct, S1 offers an alternative answer after looking at the riders’ placement on the beams.

T One hundred plus fifty plus the little mark there, seven point one.

I chose this portion of the laboratory experiment a representative sample of what the students were doing because it encompassed one lab group’s entire attempt to learn how to correctly complete the lab and offered the clearest,
identifiable instances of self-regulated behavior. Other groups had similar difficulties because it was the first time that any of the students had the opportunity to use the triple beam balance. I also selected this activity based on the clarity of the audio and video recordings. The placement of the camera relative to this group produced excellent audio and video recording of the entire interaction. The audio and video recordings for the other groups contained similar behaviors, but due to the ways in which the students moved around during the experiment and the volume of the student voices, this example offered the clearest audio and video recordings of the recorded laboratory groups.

**Self-regulated behavior in low and high examples of Instructional Conversation.**

**Low Instructional Conversation.** The low Instructional Conversation took place in the science classroom, as students were preparing for a laboratory experiment. This activity took place in a morning class in May. The physical setting for this activity was the laboratory area described in the high Complex Thinking example. There were a total of 13 students in the class, eight female and five male. The teacher had the students self-select lab groups before the start of the experiment, with no lab group containing more than four members. The students chose to form four lab groups, two with three female members, one with two female and two male members, and one with three male members. The lab group that I observed consisted of three female members who were standing at the lab table located on the same side as, and farthest away from the entryway. If viewed from the front of the classroom, this lab table would be located in the right-most corner of the room. All students in the class wore goggles and aprons.
while performing the lab, as required by the teacher, but were allowed to take the goggles off if they were working in the classroom area.

Two lab stations were set up for the day’s activity, both located along the wall on the entryway side of the classroom. Due to the fact that there were more lab groups than available lab stations, the groups that were not doing the lab experiment worked in the classroom area on their lab write-up or other assignments. A conductivity tester with probes, a rinse bottle filled with distilled water, and beakers to use as a waste collector when rinsing the probes after each experiment were placed on each of the two lab stations. The items to be tested included wood, aluminum, vegetable oil, salt water, sugar water, antacid (tablet and solution), dishwashing detergent, liquid hand soap, a carbonated soft drink, distilled water, a dilute hydrochloric acid solution, a dilute sodium hydroxide solution, aspirin (tablet and solution), baking soda (powder and solution), vinegar, lemon juice, ammonia, and tea. Half of the items to be tested were placed on each of the tables.

The procedure for the day’s lab activity was written on one of the whiteboards, located at the front of the class. Students were tasked with testing the various items provided by the teacher to determine how well each item conducted electricity by touching both probes to solid items or submerging both probes in the solutions. This example involved a conversation between the teacher and three students prior to the beginning of the lab.

The lab group was preparing to begin the experiment, but was caught by the teacher not having done the pre-lab, which was required by the teacher as a prerequisite for starting any laboratory experiment. Students in this example had some opportunity to talk with each other and as such, exhibited autonomous
behavior including the peer help-seeking behavior, monitoring progress, organization and adjusting progress as presented in Table 15.

This was an example of a low level Instructional Conversation because the teacher worked with individuals or small groups of students and (a) responded in ways that were comfortable for the students, (b) used questioning, listening or rephrasing to elicit student talk, or (c) conversed with the students on a nonacademic topic. This example was not rated at the next highest level of implementation because the teacher did not converse with a small group of students on an academic topic.

Table 15

*Instructional Conversation (IC) and Self-Regulatory Student Behaviors*

<table>
<thead>
<tr>
<th>Self-Regulatory Behavior</th>
<th>Low IC</th>
<th>High IC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Seeking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>X (24 &amp; 29)</td>
<td>X (3, 4, 5, 10, 11 &amp; 25)</td>
</tr>
<tr>
<td>Peer</td>
<td>X (11, 13)</td>
<td>X (1, 13, 15, 20 &amp; 39, 14 &amp; 29)</td>
</tr>
<tr>
<td>Environment</td>
<td>X (14)</td>
<td>X (1 &amp; 15)</td>
</tr>
<tr>
<td>Organization</td>
<td>X (2 &amp; 3)</td>
<td>X (1 &amp; 8)</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td></td>
<td>X (1 &amp; 17)</td>
</tr>
<tr>
<td>Monitoring Progress</td>
<td>X (15 &amp; 38)</td>
<td>X (7 &amp; 13)</td>
</tr>
<tr>
<td>Adjusting Progress</td>
<td>X (17 &amp; 26)</td>
<td>X (15 &amp; 17)</td>
</tr>
</tbody>
</table>

*Note.* An “X” indicates the presence of a behavior. The location of where the behavior occurred within the context of the following transcribed examples is indicated within the parentheses by transcript line numbers.
1 Teacher (T) Do you guys have these chemicals in your books?

2 Student 1 Yes.  
   (S1) (Shows lab notebook)  
   Organization: S1 is apparently prepared for the lab by having the lab notebook ready.

3 Student 3 Yes.  
   (S3) (Shows lab notebook)  
   Organization: S2 is apparently prepared for the lab by having the lab notebook ready.

4 T Mmm Hmm.  
   (Walks over to check lab notebooks on the table)

5 S1 Wait mister, Chelsey has it. She’s not even here yet.

6 T Both of you.

7 S1 Wait. OK.

8 T Both of you, you need to get these in your books. Everybody needs to have it. Take five minutes and get it written down.
9  S1  Mister.

10  T (to class)  All of you write the data in your books.

11  Group  (The three lab partners open their lab books and compare them with the S3 who had it partially done.)  Peer help-seeking: S1 & S2 seek help from S3.

12  T (to class)  You need to have the chemical data in your lab book before you start.

13  S1  Materials?  Peer help-seeking: S1 asks S3 a question.
     (Brings the lab book to partner.)

14  Student 3  All the materials we need are written on the board, right there.  Environmental help-seeking: S3 refers S1 to the board at the front of the class where the list of materials is written.
     (Points to board at the front of the class.)

15  S1  So all you put right here?  Peer help-seeking: S1 seeks help from S2.
     (Pointing to the lab book.)  Monitoring progress: S1 refers to the attempt made in the lab notebook.
     Oil, is it conductive? Then you put “no”, right? That’s what you put, right?
S2 I guess.

S1 OK. Are you sure that’s all you’re putting?  

Adjusting progress:  

S1 indicated understanding.

S3 Look, over there on the table.  

(Pointing to board at the front of the class.)

S1 Oh, right there.

S2 What is this?  

(Trying to determine a chemical symbol.)  

Peer help-seeking:  

S1 seeks help from S2.

S3 HCl.

T (Passing by the table)  

How’s it going?  

HCl.

S2 Oh, HCl.

S3 Do we have to write the formulas down?  

Teacher help-seeking: S3 asks the teacher for help.

T No. Just put Hydrochloric acid.  

You need to get organized first.

S1 Oh, so we need to make a table first, I get it.  

Adjusting progress:  

S1 indicated understanding.
T  You write all those chemicals in your table first. Then do the lab.

S1  I get it. I get it.

(Goes to sit in the individual student desks to work on pre-lab.)

S3  Do we have to write everything before we start? What is the number? What is the next one?

Teacher help-seeking: S3 asks the teacher for help.

T  Everything that’s on the board.

(Pointing to the board.)

S3  Oh, we did that

T  That’s what you need

S3  Right now?

T  Yes.

S2 & S3  (Write in lab books.)

S2  What?

S3  You gotta write it in the table so you don’t have to look it up.

S2  Vegetable oil, salt water, sugar water.

(Checking the items written in the procedure.)

Monitoring progress: S2 refers to the attempt made in the lab notebook.

S3  Vegetable?

Peer help-seeking: S3 seeks help from
S2.

I chose this portion of the laboratory experiment because it was a representative sample of what the students were doing and encompassed one lab group’s initial attempt to learn how to correctly complete the lab. Other groups had similar difficulties because it was the first time that any of the students had the opportunity to work with a conductivity tester, and the information relayed by the teacher to the entire class, shown in line 8 and line 12, helped those groups correctly complete the pre-lab portion of the experiment. I also selected this example because of the clarity of the audio and video recordings. The placement of the cameras, which were focused on the two lab tables, and the microphones, which were placed on the lab tables, allowed me to record the activity of each lab station. However, due to the ways in which the students moved around during the experiment and volume of the student voices, this example offered the clearest audio and video recordings of the recorded laboratory groups.

**High Instructional Conversation.** The high level Instructional Conversation involved students in a science classroom doing a conductivity lab. This example involved the same physical laboratory setup and same three member, all-female laboratory group as described in the low Instructional Conversation. The lab group, after the previous conversation with the teacher about the pre-lab, now appeared to fully understand what they were required to
do in the lab and made an interesting discovery while testing the various chemicals.

The lab group began testing the various chemicals with the conductivity meter, in the order they had written in their lab books, but ran into problems when they discovered one chemical did not fit with what they had written in their procedure. Their ensuing discussion provided rich opportunities for Instructional Conversation and autonomous behaviors. The students showed more occurrences of self-regulated behavior, compared to the low level Instructional Conversation, as well as an additional type of help seeking behavior and critical thinking as presented in Table 15.

I chose a Level 2 Instructional Conversation because there were no clear examples of a Level 3 conversation in the videorecordings I studied. This was an example of a Level 2 Instructional Conversation because the teacher conversed with a small group of students on an academic topic and elicited student talk with questioning, listening, rephrasing, or modeling. Although the rate of student talk was higher than teacher talk, this example was not rated as the high level Instructional Conversation because the teacher did not directly question the students on their views, judgments, or rationales.

1  Student 1  OK, this is the antacid. What's this?  
(S1)  
(Checks the lab book.)

Critical thinking: S1 appears to realize that the next chemical the group was planning to test is not listed in
the materials section for this laboratory activity.

Organization: S1 has the proper material (lab notebook) to effectively do the lab activity.

Environmental help-seeking: S1 refers to the lab notebook.

Peer help-seeking: S1 asks S2 a question.

2 Student 2 I don’t know.

(S2)

3 S1 Mr. Smith.

(Walks to the front of the room.)

Teacher help-seeking: S1 seeks out the teacher for help.

4 S1 Mr. Smith. I need some help. You know the antacid?

Teacher help-seeking: S1 asks the
What is (unintelligible)?

5  S2  What is the difference?

Teacher help-seeking: S2 asks the teacher a question.

6  Teacher (T)  There should be an antacid and (unintelligible).

7  S1  Yeah, but (unintelligible).

Monitoring progress: S1 appears to be comparing what was listed in the materials section to the unknown chemical they found.

8  S2  (Checking the lab book.)

Environmental help-seeking: S2 refers to the lab notebook.

9  T  (Comes to the lab table.)

10 S2  What is the difference?

Teacher help-seeking: S2 asks the teacher a question.

11 S1  What is that one?

Teacher help-
(Pointing at one of the bottles.)

12 T It’s the antacid.

13 S2 And this one too?
(Picks up a box.)

Monitoring progress: S2 appears to be comparing the unknown chemical they found to the antacid in the box.

14 S1 What is that? Aspirin?
(Points to bottle.)

Peer help-seeking: S1 asks S2 a question.

15 S2 Yeah, I think so that’s aspirin, because this says “antacid.”
(Reading box label.)

Adjusting progress: S2 appears to be confirming S1’s statement.

Environmental help-seeking: S2 refers to box label.

16 Student 3 Baking Soda?
(S3)

This question was not classified as either peer or teacher help-seeking.
because the question was not directed at any particular individual.

Critical Thinking:
S1 notices it cannot be aspirin because that chemical is on the other lab table.

Adjusting progress:
S1 notices it cannot be aspirin because that chemical is on the other lab table.

18 T Let me see your book.
(Looks over student’s lab book.)

19 S1 Maybe Ammonia?
(Joking based on a previous conversation with the teacher where the student had confused ammonia and pneumonia.)

20 S2 I think its aspirin.

21 S1 No, its not. Cause aspirin is over there.
(Poins to the other lab table again.)
S2 Oh.

S1 Stuff to make us sneeze?

S2 Yeah, all of us.

S1 Just kidding. What is it? Antacid?  Teacher help-seeking: S1 asks the teacher a question.

T That one is antacid.  (Points to the box of antacids.)

S1, S2, S3 Yeah.

T So that one is Alka Seltzer.

S3 How do you spell that?  Peer help-seeking: S3 asks S2 a question.

A2 A-L-K-A

S3 A-L-K-A

S1 S-E-L-T-Z-E-R

S3 S-E-L-T-C

S2 Z

I chose this portion of the laboratory experiment as a representative sample of what the students were doing because it clearly showed one group’s in-depth understanding of what was supposed to happen in the lab. The students knew which chemicals they were supposed to test and recognized that they had a chemical that was not originally on the list. Students used an Instructional Conversation to confirm their understanding and eventually the
unidentified chemical was determined to be Alka Seltzer, in powdered form. The teacher then made an announcement to the class, asking them to add the chemical to their materials list. I also selected this example based on the clarity of the audio and video recordings. The placement of the cameras, which were focused on the two lab stations, and the microphones, which were placed on two of the lab tables, allowed me to record the activity at each lab station. However, due to the ways that students moved around during the experiment and volume of the student voices, this example offered the clearest audio and video recordings of the recorded laboratory groups.

**Student Surveys**

**Reliability.** The reliability indices in Table 16 measured by the Cronbach’s $\alpha$ were acceptable, with a range from .70 to .93 for the pre-test and .66 to .84 for the post-test. All pre-test values were higher than the corresponding post-test values.

Table 16

*Cronbach’s $\alpha$ values of self-regulatory constructs on Pre-test and Post-test*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Value</td>
<td>.87</td>
<td>.82</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>.93</td>
<td>.84</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td>.85</td>
<td>.82</td>
</tr>
<tr>
<td>Cognitive Strategies</td>
<td>.85</td>
<td>.81</td>
</tr>
<tr>
<td>Self-Regulation</td>
<td>.70</td>
<td>.66</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td><strong>.93</strong></td>
<td><strong>.89</strong></td>
</tr>
</tbody>
</table>
Intrinsic Value.

Table 17 presents the descriptive statistics for intrinsic value. The possible range of scores for intrinsic value was from 9-63, with higher scores indicating higher intrinsic value. The obtained range for pre-test scores was from 14-63 and the obtained range for post-test scores was from 26-61.

Table 17
Descriptive Statistics for Intrinsic Value

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>46.07</td>
<td>8.68</td>
<td>49.78</td>
</tr>
<tr>
<td>Middle School</td>
<td>32.85</td>
<td>9.50</td>
<td>43.00</td>
</tr>
<tr>
<td>Overall</td>
<td>41.78</td>
<td>10.83</td>
<td>47.58</td>
</tr>
</tbody>
</table>

Interaction effect between professional development time period and grade level. As indicated in Table 18, there was a significant interaction effect between the professional development time period and grade level ($F(1,38) = 4.845, p < .05$) across the two grade levels. The partial Eta squared for the professional development time period by grade level was .113, which means that the interaction between the professional development time period and grade level accounted for 11.3% of the overall (professional development time period + error) variance. The observed power for within subjects testing was .574, which
indicated a moderate probability of finding a significant difference in the population if one existed.

Table 18

*Repeated Measures ANOVA for Intrinsic Value*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Partial ( \eta^2 )</th>
<th>Observed Power</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade Level</td>
<td>1756.000</td>
<td>1</td>
<td>1756.000</td>
<td>15.625**</td>
<td>.291</td>
<td>.971</td>
</tr>
<tr>
<td>Error</td>
<td>4270.550</td>
<td>38</td>
<td>112.383</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>842.539</td>
<td>1</td>
<td>842.539</td>
<td>22.363**</td>
<td>.370</td>
<td>.996</td>
</tr>
<tr>
<td>Time*</td>
<td>182.539</td>
<td>1</td>
<td>182.539</td>
<td>4.845*</td>
<td>.113</td>
<td>.574</td>
</tr>
<tr>
<td>Grade Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error (Time)</td>
<td>1431.661</td>
<td>38</td>
<td>37.675</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8483.289</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Time = Professional Development Time Period.

*p < .05.  **p < .01.
Figure 1 shows the patterns of changes on the pretest and the posttest for intrinsic value were different across the different grade levels.

![Graph showing the interaction between Professional Development Time Period and Grade Level for Intrinsic Value.](image)

*Figure 1.* Interaction between Professional Development Time Period and Grade Level for Intrinsic Value.

**Main effects.** Two main effects were observed. There was a significant between-subjects effect due to the grade levels ($F(1,38) = 15.625, p < .01$). The mean intrinsic value score of the high school students ($M = 96.15, SD = 14.03$) was higher than the mean intrinsic value score of the middle school students ($M = 76.31, SD = 15.05$) as shown in Table 17. The partial Eta squared for grade level was .291, which means that grade level by itself accounted for 29.1% of the overall (grade level + error) variance. The observed power for between subjects testing was .971, which indicated a high probability of finding a significant difference in the population if one existed. Next, the within-subjects effect was
also significant \(F(1,38) = 22.363, p < .01\). The posttest mean score for intrinsic value \((M = 47.58, SD = 8.86)\) was higher than the pretest mean score for intrinsic value \((M = 41.78, SD = 10.83)\). The partial Eta squared for the professional development time period was .370, which means that the professional development time period by itself accounted for 37.0% of the overall (professional development time period + error) variance. The observed power for within subjects testing was .996, which indicated a high probability of finding a significant difference in the population if one existed.

**Self-Efficacy.**

Table 19 presents the descriptive statistics for self-efficacy. The possible range of scores for self-efficacy was from 9-63, with higher scores indicating higher self-efficacy. The obtained range for pre-test scores was from 23-63 and the obtained range for post-test scores was from 37-63.

Table 19

*Descriptive Statistics for Self-Efficacy*

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
<td>M</td>
<td>50.07</td>
<td>53.26</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>9.42</td>
<td>6.69</td>
</tr>
<tr>
<td>Middle School</td>
<td>M</td>
<td>35.38</td>
<td>49.00</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>9.34</td>
<td>7.27</td>
</tr>
<tr>
<td>Overall</td>
<td>M</td>
<td>45.30</td>
<td>51.88</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>11.60</td>
<td>7.08</td>
</tr>
</tbody>
</table>

*Interaction effect between professional development time period and grade level.* As indicated in Table 20, there was a significant interaction effect
between the professional development time period and grade level \( (F(1,38) = 15.805, p < .01) \) across the two grade levels. The partial Eta squared for the professional development time period by grade level was .294, which means that the interaction between the professional development time period and grade level accounted for 29.4\% of the overall (professional development time period + error) variance. The observed power for within subjects testing was .972, which indicated a high probability of finding a significant difference in the population if one existed.

Table 20

Repeating Measures ANOVA for Self-Efficacy

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>( \eta^2 )</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade Level</td>
<td>1575.349</td>
<td>1</td>
<td>1575.349</td>
<td>14.956**</td>
<td>.282</td>
<td>.965</td>
</tr>
<tr>
<td>Error</td>
<td>4002.538</td>
<td>38</td>
<td>105.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1238.412</td>
<td>1</td>
<td>1238.412</td>
<td>41.008**</td>
<td>.519</td>
<td>1.00</td>
</tr>
<tr>
<td>Time *</td>
<td>477.312</td>
<td>1</td>
<td>477.312</td>
<td>15.805**</td>
<td>.294</td>
<td>.972</td>
</tr>
<tr>
<td>Grade Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error (Time)</td>
<td>1147.575</td>
<td>38</td>
<td>30.19936</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8441.187</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Time = Professional Development Time Period.

*\( p < .05 \).  **\( p < .01 \).
Figure 2 shows the patterns of changes on the pretest and the posttest for self-efficacy were different across the different grade levels.

![Graph showing patterns of changes on pretest and posttest for self-efficacy across different grade levels.](image)

**Figure 2.** Interaction between Professional Development Time Period and Grade Level for Self-Efficacy.

**Main effects.** Two main effects were observed. There was a significant between-subjects effect due to the grade levels ($F(1,38) = 14.956, p < .01$). The mean self-efficacy score of the high school students ($M = 103.33, SD = 14.40$) was higher than the mean self-efficacy score of the middle school students ($M = 84.38, SD = 14.76$) as shown in Table 19. The partial Eta squared for grade level was .282, which means that grade level by itself accounted for 28.2% of the overall (grade level + error) variance. The observed power for between subjects testing was .965, which indicated a high probability of finding a significant difference in the population if one existed. Next, the within-subjects effect was also significant...
\( F(1,38) = 41.008, p < .01 \). The posttest mean score for self-efficacy \((M = 51.88, SD = 7.08)\) was higher than the pretest mean score for self-efficacy \((M = 45.30, SD = 11.60)\). The partial Eta squared for the professional development time period was .519, which means that the professional development time period by itself accounted for 51.9\% of the overall (professional development time period +
error) variance. The observed power for within subjects testing was 1.000, which indicated a high probability of finding a significant difference in the population if one existed.

**Test Anxiety.**

Table 21 presents the descriptive statistics for test anxiety. The possible range of scores for test anxiety was from 4-28, with higher scores indicating higher test anxiety. The obtained range for pre-test scores was from 4-28 and the obtained range for post-test scores was from 4-26.

Table 21

*Descriptive Statistics for Test Anxiety*

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>( M )</td>
<td>13.41</td>
<td>14.15</td>
<td>13.78</td>
</tr>
<tr>
<td>High School</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( SD )</td>
<td>6.43</td>
<td>6.22</td>
<td>6.32</td>
</tr>
<tr>
<td>( M )</td>
<td>12.77</td>
<td>15.15</td>
<td>13.96</td>
</tr>
<tr>
<td>Middle School</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( SD )</td>
<td>6.62</td>
<td>4.83</td>
<td>5.79</td>
</tr>
<tr>
<td>( M )</td>
<td>13.20</td>
<td>14.48</td>
<td>13.84</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( SD )</td>
<td>6.42</td>
<td>5.76</td>
<td>6.09</td>
</tr>
</tbody>
</table>
Interaction effect between professional development time period and grade level. As indicated in Table 22, there was a non-significant interaction effect between the professional development time period and grade level \(F(1,38) = .531, p > .05\) across the two grade levels.

Table 22
Repeated Measures ANOVA for Test Anxiety

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>(\eta^2)</th>
<th>Observed Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade Level</td>
<td>.593</td>
<td>1</td>
<td>.593</td>
<td>.011</td>
<td>.000</td>
<td>.051</td>
</tr>
<tr>
<td>Error</td>
<td>2038.795</td>
<td>38</td>
<td>53.652</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>42.856</td>
<td>1</td>
<td>42.856</td>
<td>1.918</td>
<td>.048</td>
<td>.271</td>
</tr>
<tr>
<td>Time *</td>
<td>11.856</td>
<td>1</td>
<td>11.856</td>
<td>.531</td>
<td>.014</td>
<td>.109</td>
</tr>
<tr>
<td>Grade Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error (Time)</td>
<td>849.131</td>
<td>38</td>
<td>22.346</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2943.231</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Time = Professional Development Time Period.

*p < .05. **p < .01.

Main effects. Two non-significant main effects were observed. There was a non-significant between-subjects effect due to the grade levels \(F(1,38) = .011, p > .05\). The mean test anxiety score of the high school students \((M = 27.56, SD = 10.38)\) was not significantly higher than the mean test anxiety score of the middle
school students ($M = 27.92, SD = 10.31$) as shown in Table 21. Next, the within-subjects effect was also non-significant ($F(1,38) = 1.918, p > .05$). The posttest mean score for test anxiety ($M = 14.48, SD = 5.76$) was higher than the pretest mean score for test anxiety ($M = 13.20, SD = 6.42$).

**Cognitive Strategies.**

Table 23 presents the descriptive statistics for cognitive strategies. The possible range of scores for cognitive strategies was from 13-91, with higher scores indicating greater cognitive strategy use. The obtained range for pre-test scores was from 28-82 and the obtained range for post-test scores was from 33-79.

Table 23

*Descriptive Statistics for Cognitive Strategies*

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
<td>$M$</td>
<td>58.63</td>
<td>66.44</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>12.72</td>
<td>8.95</td>
</tr>
<tr>
<td>Middle School</td>
<td>$M$</td>
<td>47.62</td>
<td>59.77</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>12.77</td>
<td>13.44</td>
</tr>
<tr>
<td>Overall</td>
<td>$M$</td>
<td>55.05</td>
<td>64.28</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>13.62</td>
<td>10.91</td>
</tr>
</tbody>
</table>

*Interaction effect between professional development time period and grade level.* As indicated in Table 24, there was a non-significant interaction effect between the professional development time period and grade level ($F(1,38) = .838, p > .05$) across the two grade levels.
Table 24

Repeated Measures ANOVA for Cognitive Strategies

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Partial η²</th>
<th>Observed Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade Level</td>
<td>1372.923</td>
<td>1</td>
<td>1372.923</td>
<td>7.827**</td>
<td>.171</td>
<td>.778</td>
</tr>
<tr>
<td>Error</td>
<td>6665.464</td>
<td>38</td>
<td>175.407</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1749.504</td>
<td>1</td>
<td>1749.504</td>
<td>17.743**</td>
<td>.318</td>
<td>.984</td>
</tr>
<tr>
<td>Time *</td>
<td>82.604</td>
<td>1</td>
<td>82.604</td>
<td>.838</td>
<td>.022</td>
<td>.145</td>
</tr>
<tr>
<td>Grade Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error (Time)</td>
<td>3746.883</td>
<td>38</td>
<td>98.602</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13617.378</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Time = Professional Development Time Period.
*p < .05.  **p < .01.

**Main effects.** Two main effects were observed. There was a significant between-subjects effect due to the grade levels ($F(1,38) = 7.827, p < .01$). The mean cognitive strategies score of the high school students ($M = 125.04, SD = 15.82$) was higher than the mean cognitive strategies score of the middle school students ($M = 107.38, SD = 23.85$) as shown in Table 23. The partial Eta squared for grade level was .171, which means that grade level by itself accounted for 17.1% of the overall (grade level + error) variance. The observed power for between subjects testing was .778, which indicated a moderate probability of
finding a significant difference in the population if one existed. Next, the within-subjects effect was also significant ($F(1,38) = 17.743, p < .01$). The posttest mean score for cognitive strategies ($M = 64.28, SD = 10.91$) was higher than the pretest mean score for cognitive strategies ($M = 55.05, SD = 13.62$). The partial Eta squared for the professional development time period was .318, which means that the professional development time period by itself accounted for 31.8% of the overall (professional development time period + error) variance. The observed power for within subjects testing was .984, which indicated a high probability of finding a significant difference in the population if one existed.

**Self-Regulation.**

Table 25 presents the descriptive statistics for self-regulation. The possible range of scores for self-regulation was from 9-63, with higher scores indicating higher self-regulation. The obtained range for pre-test scores was from 14-47 and the obtained range for post-test scores was from 25-59.

Table 25

*Descriptive Statistics for Self-Regulation*

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>34.52</td>
<td>39.63</td>
<td>37.07</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>8.89</td>
<td>8.02</td>
</tr>
<tr>
<td></td>
<td>$M$</td>
<td>30.85</td>
<td>40.15</td>
</tr>
<tr>
<td>Middle School</td>
<td>8.57</td>
<td>7.86</td>
<td>8.22</td>
</tr>
<tr>
<td></td>
<td>$M$</td>
<td>33.33</td>
<td>39.80</td>
</tr>
<tr>
<td>Overall</td>
<td>$SD$</td>
<td>8.85</td>
<td>7.87</td>
</tr>
</tbody>
</table>
Interaction effect between professional development time period and grade level. As indicated in Table 26, there was a non-significant interaction effect between the professional development time period and grade level ($F(1,38) = 1.482, p > .05$) across the two grade levels.

Table 26

Repeated Measures ANOVA for Self-Regulation

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>$\eta^2$</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade Level</td>
<td>43.484</td>
<td>1</td>
<td>43.484</td>
<td>.490</td>
<td>.013</td>
<td>.105</td>
</tr>
<tr>
<td>Error</td>
<td>3369.704</td>
<td>38</td>
<td>88.676</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>912.170</td>
<td>1</td>
<td>912.170</td>
<td>17.500**</td>
<td>.315</td>
<td>.983</td>
</tr>
<tr>
<td>Time *</td>
<td>77.270</td>
<td>1</td>
<td>77.270</td>
<td>1.482</td>
<td>.038</td>
<td>.221</td>
</tr>
<tr>
<td>Grade Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error (Time)</td>
<td>1980.718</td>
<td>38</td>
<td>52.124</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6383.346</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Time = Professional Development Time Period.

*p < .05. **p < .01.

Main effects. Two main effects were observed. There was a non-significant between-subjects effect due to the grade levels ($F(1,38) = .490, p > .05$). The mean self-regulation score of the high school students ($M = 74.15, SD = 12.31$) was not significantly higher than the mean self-regulation score of the
middle school students ($M = 71.00, SD = 15.27$) as shown in Table 25. Next, the within-subjects effect was significant ($F(1,38) = 17.500, p < .01$). The posttest mean score for self-regulation ($M = 39.80, SD = 7.87$) was higher than the pretest mean score for self-regulation ($M = 33.33, SD = 8.85$). The partial Eta squared for the professional development time period was .315, which means that the professional development time period by itself accounted for 31.5% of the overall (professional development time period + error) variance. The observed power for within subjects testing was .983, which indicated a high probability of finding a significant difference in the population if one existed.
CHAPTER 5

Discussion

I divided Chapter 5 into four parts: (a) Classroom Videorecordings and Student Surveys, (b) Support for Sociocultural Theory and Self-Regulation, (c) Theoretical and Educational Implications, and (d) Future Directions and Limitations. The first section begins with a discussion of the findings and shows empirically how the students’ self-regulatory behavior changed over the professional development time period. This section also describes how the data fit together and address the research questions. The second section presents arguments for the use of sociocultural theory as the theoretical foundation for this study and offers support for the inclusion of social cognitive theory and self-regulation. The third section describes the theoretical and educational implications of the study. The last section describes the potential future directions for the study and the limitations that may be involved in any attempt to extend or replicate the study.

Classroom Videorecordings and Student Surveys

The results of my data analysis of the classroom videorecordings answered my first research question: How is teachers’ implementation of the CREDE Standards for Effective Teaching and Learning related to student self-regulatory behavior? Table 10 indicates that the self-regulated student behaviors per student per minute of observed time increased in all instances when teachers implemented the Five Standards to a higher degree. The types of student self-regulatory behaviors also increased in all instances over the professional development time period as indicated in Table 27.
Table 27

Types of Student Self-Regulatory Behaviors for each CREDE Standard

<table>
<thead>
<tr>
<th>CREDE Standard</th>
<th>Level of Teacher Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Joint Productive Activity</td>
<td>1</td>
</tr>
<tr>
<td>Language and Literacy Development</td>
<td>1</td>
</tr>
<tr>
<td>Contextualization</td>
<td>1</td>
</tr>
<tr>
<td>Complex Thinking</td>
<td>1</td>
</tr>
<tr>
<td>Instructional Conversation</td>
<td>5</td>
</tr>
</tbody>
</table>

These findings indicate that the type and frequency of student self-regulated behaviors was higher in classrooms where teachers implemented the Five Standards. This result is consistent with Eshel and Kohavi’s (2003) view that students exhibit greater amounts of self-regulatory behavior in classrooms when given a high level of control and the teacher’s control is limited. In the classrooms studied, higher-level teacher implementation of the Five Standards created classroom environments that were conducive to student choice, and as such, these settings encouraged the development of self-regulatory behaviors. Other scholars also support the view that the appropriate environment can produce an increase in self-regulatory behaviors (Boekaerts & Cascallar, 2006; Boekaerts, de Koning, & Vedder, 2006; Boekaerts & Niemivirta, 2000; Perry et al., 2002).

These findings also indicate that in the classroom situations observed where teacher implementation of the Five Standards was low during the professional development time period, students relied on self-regulatory strategies that focused primarily on help-seeking behaviors. The observed
lessons were characterized by teacher-centered, indirect learning experiences that created what Boekaerts and Niemivirta (2000) described as an environment where students do not have enough opportunities to organize and regulate their own learning. During the lessons that were rated low, students were passive participants, or receptors of information, rather than active participants in the creation of their own knowledge.

In situations during the professional development time period where teachers implemented the Five Standards at higher levels, student use of self-regulatory strategies increased to include not only help-seeking behaviors, but also components related to organization, critical thinking, monitoring and adjusting progress, self-evaluation and self-reaction. Teachers in each of the high-level implementation classrooms provided students with learning opportunities that were contextually relevant and focused. The resultant student-teacher conversations produced an environment that provided the students with opportunities to acquire new knowledge and skills (Boekaerts & Niemivirta, 2000). This student-teacher dialogue was typical of Instructional Conversations because the conversations exhibited not only the teacher-like discourse pattern described by Turner and Meyer (2000), but also gave the students the opportunity to reflect critically on their performances. As these students actively monitored and adjusted their progress, they were able to achieve an enhanced conceptual grasp of the situation and select the most appropriate strategies to solve the problems they faced (Paris & Newman, 1990).

The findings related to the Instructional Conversations, when compared to the other Standards, answered my second research question: Are certain CREDE Standards for Effective Teaching and Learning more likely to influence
students’ self-regulatory behavior? Higher-level implementation of all Five Standards contributed to an increase in student self-regulated behavior in the classrooms observed as indicated in Table 27. However, it appears that teachers’ use of Instructional Conversations was especially valuable because this type of instruction produced increased levels of student self-regulatory behavior at lower levels of implementation as well as higher ones.

This outcome makes sense when looking at the findings through a sociocultural lens. In this view, an Instructional Conversation, or any conversation with a more capable individual, involves a social interaction where the sharing between individuals creates opportunities for the learner to appropriate new ideas (John-Steiner & Mahn, 1996). The resulting appropriation increases the individual’s knowledge, but does not ensure that the individual will be able to pick the self-regulatory strategies that are appropriate to the situation. Novice learners may, as Winne (1995b) suggested, fail at the task at hand because they pick strategies that worked well in the past, but are not connected to the instructional goals. It is the Instructional Conversation that confirms for learners that their understanding of the material and instructional goals are accurate, and as such, allows them to confidently select from the self-regulatory strategies available to them.

The results of the student surveys helped answer my third research question: How do the self-regulatory constructs of self-efficacy, intrinsic value, test anxiety, self-regulation, and the use of learning strategies change over time as teachers implemented the CREDE Standards for Effective Teaching and Learning?
The first finding was related to the reliability of the constructs in this study as compared to the original study. The Cronbach’s alpha values for the pre-tests show that the reliability of three constructs, self-efficacy, test anxiety, and cognitive strategies, was higher than that of the original study. One construct, intrinsic value, exhibited the same reliability and one construct, self-regulation, showed lower reliability. The post-test Cronbach’s alpha values for the student survey got smaller for each of the constructs, which may indicate the possibility of an effect from the teachers’ professional development time period on the student population changed an initially homogeneous population to one where student proficiency varied.

The rest of the findings, summarized in Table 28, were related to the significant effects for each of the five self-regulatory constructs. For intrinsic value, both the between subjects and within subjects effects were highly significant at the p < .01 level, indicating that for intrinsic value, the grade level and the professional development time period both had an influence on the pre-test and post-test results. The interaction effect was also significant at the p < .05 level, indicating that for intrinsic value there may have been some unique effect based on the combination of grade level and the professional development time period.
Table 28

*Summary Table of Significant Effects*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Between Subjects</th>
<th>Within Subjects</th>
<th>Interaction Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Value</td>
<td>**</td>
<td>**</td>
<td>*</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Strategies</td>
<td>**</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>Self-Regulation</td>
<td></td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

*Note.*  *p < .05.  **p < .01.*

For self-efficacy, both the between subjects and within subjects effects were highly significant at the *p < .01* level, indicating that for self-efficacy the grade level and the professional development time period both had an influence on the pre-test and post-test results. The interaction effect was also highly significant at the *p < .01* level, indicating that for self-efficacy, there may have been some unique effect based on the combination of grade level and the professional development time period.

For test anxiety, both the between subjects and within subjects effects were not significant, *p > .05*, indicating that for test anxiety the grade level and the professional development time period did not have an influence on the pre-test and post-test results. The interaction effect was also not significant, *p > .05*, indicating that for test anxiety, there was no unique effect based on the combination of grade level and the professional development time period.
For cognitive strategies, both the between subjects and within subjects effects were highly significant at the p < .01 level, indicating that for cognitive strategies, the grade level and the professional development time period both had an influence on the pre-test and post-test results. The interaction effect was not significant, p < .05, indicating that for cognitive strategies there was no unique effect based on the combination of grade level and the professional development time period.

For self-regulation, the between subjects effect was not significant, p > .05, indicating that there was not an effect of grade level on pre-test and post-test results for self-regulation. The within subjects effect was highly significant at the p < .01 level, indicating that for self-regulation, the professional development time period had an influence on the pre-test and post-test results. The interaction effect was not significant, p > .05, indicating that for self-regulation there was no unique effect based on the combination of grade level and the professional development time period.

The interaction results indicate that there was a grade level and professional development time period effect on the pre-test and post-test for intrinsic value and self-efficacy. The presence of this interaction effect could make the interpretation of the between subjects and within subjects more difficult.

The between subjects results indicate that grade level influenced the pre-test and post-test results for intrinsic value and self-efficacy. This discovery differs with previous research indicating that the level of negative motivational outcomes, including a lack of student self-directedness and a declining desire to engage in the learning process, tends to increase during the transition from
middle school to high school (Eccles et al., 1993; Hong, Peng & Rowell, 2009). While this finding may be a characteristic unique to the population examined in this study, further research on the grade level influence is suggested to confirm or refute this relationship.

The within subjects results indicated that the professional development time period influenced the pre-test and post-test results for all constructs except for test anxiety. This finding was consistent with research supporting the importance of the teacher’s role in developing self-regulatory behavior (Eshel & Kohavi, 2003) and research documenting the importance of creating an environment conducive to the development and use of students’ self-regulatory strategies (Boekaerts & Cascallar, 2006).

The discovery that test anxiety did not exhibit an interaction effect, nor was it affected by either grade level or the professional development time period, was interesting, though not unexpected. Pintrich and De Groot (1990) include test anxiety, along with intrinsic value and self-efficacy, as important motivational constructs that are tested by the MSLQ. The authors state that test anxiety is one of the most important contextual factors in the school learning because of its effect on an individual’s motivation. However, the authors also state that test anxiety’s relationship to self-regulated learning is not as straightforward because it did not show the same type of positive, linear relationship to self-regulated learning as the other motivational constructs.

One reason why test anxiety may not change over time is based on how it is conceptualized. Test anxiety can be viewed as either a trait or a state, with the possibility for change being based on the characterization. According to Putwain (2008), if test anxiety is viewed as a trait, where the individual perceives all tests
as threatening, regardless of the context, the likelihood of the anxiety changing over time is virtually non-existent. However, if test anxiety is viewed as a state, where the anxiety is dependent on the specific context of the assessment, it may change over time as individuals become more comfortable testing situations. Students in this study may have had a more trait-like view of test anxiety, and as such, may not have been able to change the way that they perceived tests, irrespective of the implementation of the Five Standards.

The classroom videorecordings and student survey data sets worked exactly as a mixed-method design should. By that, I mean that they served as complements to each other by looking at the research questions from different angles and with each confirming that what was seen in one was also taking place in the other. The findings from both data sets indicate that student self-regulatory behavior may increase in environments where there is a higher-level of teacher implementation of the Five Standards. This finding serves as additional confirmation that higher levels of Five Standard implementation appear to contribute to an increase in student self-regulated behavior. As I will discuss later, lower level implementation does not necessarily represent ineffective instruction.

Support for Sociocultural Theory and Self-Regulation

The world is indeed shrinking, as technological advancements make it easier than ever to break down geographic and distance barriers. In preparation for this global society, policy-makers in national and local governments are reorganizing schools into learning environments that provide students with opportunities for self-regulation (Boekaerts, 1999). Embedded within this push to create more conducive leaning environments is the increased emphasis on the
role that context plays in the shaping of students’ self-regulatory behaviors. The social component of context, whether it is in the cognitive, constructivist or cultural domain, must be considered in any attempt to produce practical and relevant research (Perry, 2002). Towards this end, both the nature of the classroom and the teacher-student interaction must change.

Traditional classrooms where students routinely follow teacher direction and learn through observation rather than active participation should be the exception rather than the rule. While observational learning (Bandura, 1977) has a place in the educational process, it does not provide students with enough opportunities to engage in self-regulated learning behaviors. Classrooms should be places where learners, as Zimmerman (2000) noted, have not only the opportunity to observe, but also have the opportunity to emulate, replicate, and adapt the information to other situations. Teachers must also change from dispensers of information to individuals who, as Vygotsky (1978) put it, actively guide the learner’s development by planning and designing learning experiences that are within the student’s ZPD.

I chose Vygotsky’s sociocultural theory as the centerpiece of this research because I felt that it most effectively incorporated the important elements of the educational process. Specifically, I believe that in order to fully understand how students learn, we must also understand the nature of the social interactions that take place, the cultural context woven into the interactions and the role that language plays during the learning process.

Vygotsky’s sociocultural theory also provided the conceptual structure for the development of the Center for Research on Education, Diversity and Excellence, which developed the Five Standards (Tharp, 1997). The Five
Standards form the basis of a successful method designed to create favorable learning environments for students with culturally and linguistically diverse backgrounds (Tharp et al., 2000). Given my previous experience in Hawai’i’s cultural and linguistically diverse classrooms, my belief in sociocultural theory, and the Five Standards’ link to Vygotskian theory, I decided to use the Five Standards to examine student behavior in the classroom.

Prior to beginning my research, I needed to decide what aspect of student behavior I wanted to study. In my previous life as a secondary teacher, I noticed that some curricular units produced more student self-regulatory behavior than others. Not only that, even when I tried to incorporate self-regulatory strategies into my instruction, some of the students exhibited increases in the desired behaviors while others did not. This dichotomy prompted me to pursue this dissertation, where seven factors confirmed for me that I could study self-regulated learning using a sociocultural lens.

First, Boekaerts and Corno (2005) provided a framework for understanding why some students increased self-regulatory behavior and others did not, even though they might be in the same class. The authors suggested that the classroom was a complex learning environment where students pursued multiple goals that might overlap and change over time. Students in these environments attempted to satisfy two equally important, yet parallel sets of goals; their growth goals, related to increasing their knowledge or social skills, and well being goals, related to protecting their self-image. As classroom instruction continued, the students tried to balance the two competing goal structures based on the importance given to each individual goal. Thus, students who chose to focus on well-being goals may not have incorporated the self-
regulatory strategies because these strategies were of secondary or tertiary importance.

Second, Eshel and Kohavi (2003) provided support for the idea that while teachers played an important role in helping students learn self-regulatory strategies, it is not sufficient to focus only on teacher behaviors. The authors found that teachers played an important role in coaching students to become more self-regulated learners, but that the amount of student and teacher control in the classroom played an important role as well. The authors also suggested that students exhibited more self-regulatory behavior in classrooms when they had a higher level of perceived control. This is not to say that teachers had a lesser role, but rather, that both the students and teachers needed to take a greater responsibility for the learning process. This view fit perfectly with the adoption of the Five Standards, where students take a more active role in the learning process and teachers develop lessons that are contextually relevant and developmentally appropriate for the students.

Third, Olaussen and Braten’s (1999) confirmed that cultural components were important to self-regulation. The authors’ study of cross-cultural perspectives suggested that certain aspects of students’ self-regulatory behavior might be tied to their cultural membership. The authors also suggested that students who came from a culture where individualism, independence and the willingness to question authority was valued were more likely to adopt different self-regulatory strategies than students from cultures where value collectivism, rote memorization, and passive learning were valued. Turingan and Yang (2009) also found that sociocultural factors might have been factors in the differences they observed in studying Filipino and Korean students. These views also
support the adoption of the Five Standards because Hawai‘i’s classrooms are culturally and linguistically diverse and the Five Standards were designed to specifically help increase achievement among diverse student populations.

Fourth, Winne (1995a) found that self-regulatory behavior increased as learners took part in instructional experiences, irrespective of whether the events occurred over a single study session, adjacent sessions, or something appreciably longer. This finding eased my initial fear, that the data collection period I had was not going to be long enough to see any increase in students’ use of self-regulatory strategies, and confirmed that I could use the Five Standards to study student self-regulated behavior in the time frame I had to complete this study.

Fifth, I was initially worried that the learning process could not be both autonomous and self-regulated in a group setting. This was because autonomous, self-directed processes take place within the individual, and if I observed classrooms where the Five Standards were implemented, social interactions and their resulting conversations would be more prevalent. However, Winne (1995b) described the learning process as inherently social, because other individuals made contributions to the learner’s knowledge base that the learner could not achieve alone. This finding supported my initial assumption and was consistent with my theoretical framework. McCombs and Whisler (1989) also found that learning, even within group settings was an autonomous, independent, self-regulated process, because how much the individual learned was based on the individual’s ability to identify and apply appropriate strategies. The authors also suggested that relevant and meaningful tasks were essential for student success. These findings further confirmed that the Five Standards, which emphasized the development lessons with
contextually relevant material and creation of products through joint productive activity, were the right choice for this study.

Sixth, Perry and Winne (2006) stated that self-report measures were not adequate, in and of themselves, because they were not always context dependent and the survey takers’ memory of the quality of their actions might not always be accurate. The authors further asserted that it was essential to obtain records of not just what the learners said they did, but what they actually did. This is why I chose the methods I used to examine my research questions. My initial thought was to use a only a survey, but I worried that one measure would not be sufficient to provide the clearest picture of the multiple levels of activity going on in the classrooms. Perry (2002) stated that investigators using sociocultural theories to investigate self-regulated learning in naturalistic contexts must use methods that can be adapted to the unique characteristics of the learning environment being studied. These findings led me to adopt a mixed-methods design that incorporated videorecordings as a way to not only record classroom behavior, but as a means of keeping a permanent record that I could revisit if needed.

Finally, numerous scholars offered support for a possible link between the implementation of the Five Standards and self-regulated learning. Perry, Phillips and Dowler (2004) established support for Joint Productive Activity and Complex Thinking, stating that students who created joint products and worked on complex tasks that focused on uncovering deeper meaning exhibited more self-regulatory behavior. Boekaerts et al. (2006) and Perry (2002) emphasized the importance of Contextualization, confirming the important role that context played in self-regulation. Finally, Turner et al. (2002) offered support for
Language and Literacy Development and Instructional Conversation, highlighting the importance of negotiated meaning and instructional discourse.

**Theoretical and Educational Implications**

The theoretical underpinnings of sociocultural theory appear to be supported by the findings of this study. The results demonstrated the importance of the social and environmental aspects of the educational process, including the learning environment, teacher, and contextual learning opportunities. One finding of this study indicated that Instructional Conversations contributed to increased levels of student self-regulated behavior at lower levels of teacher implementation, whereas the other Standards did not. This result implied that Instructional Conversations, even at low levels of implementation, created learning environments that allowed students to demonstrate self-regulatory behavior. This was not surprising, given the importance of discourse in supporting student autonomy (Turner et al., 2002) and the benefits of learning environments that allow students to self-regulate their learning (Boekaerts & Cascallar, 2006). Instructional Conversations are, I believe, the most important of the Five Standards because they create a synergistic effect when used with the other Standards. That is, it is not possible to create a supportive learning environment, with contextually relevant or content appropriate materials, if there is no discussion about how to use them or feedback on whether the learner is making progress. Doherty et al. (2003) support this view, stating that Instructional Conversations help students learn new material during Joint Productive Activity by making it easier for students to access prior knowledge, make connections to the new material, and store the new information in long term memory.
This study has the potential to help educators understand how teacher implementation of the five CREDE Standards contributes to students’ use of self-regulatory strategies. The examination of the level of CREDE implementation in the classroom and the level of student self-regulatory behavior determined by observation and student survey results suggest that the type of instruction may influence student behavior. Establishing a relationship between the implementation of the CREDE Standards and increases in student behaviors may allow for stronger predictions about the style of instruction that would be most likely to produce more self-regulated learners. These predictions can then be disseminated to teachers who will be able to use the instructional strategies in their classrooms to produce more self-regulated learners.

This is not to say that the implications are limited only to education, with respect to students performing more capably on test, because they can also be related to more general applications as well. For example, students who are able to generalize something as simple as a help-seeking behavior to other contexts will benefit in the workplace if they know who to ask or where to find the appropriate information. Additionally, being able to generalize organizational skills would provide benefits in all areas of one’s life, including personal finance, time management and meeting deadlines, and work life. Being able to generalize one’s critical thinking skills to other contexts would undoubtedly be beneficial in all areas of one’s life as well, since the ability to take in, process and use information to make good choices is necessary for success in everything from school, to work, to doing something as common as choosing the best car or appliance to buy. Finally, the ability to generalize the behaviors of monitoring and adjusting progress to other contexts would be useful in the work
environment when a project with a deadline is undertaken or when trying to learn new skills to play a sport or musical instrument.

**Future Directions and Limitations**

Future research focusing on whether higher levels of teacher implementation of the Five Standards increase student self-regulatory behavior should focus on five important areas. First, future studies should include ways to document what the students were thinking as they exhibited the self-regulatory behaviors. Having students comment immediately after choosing a particular course of action would provide a deeper understanding of the students’ thought processes as they engaged in their activities. Perry and Winne (2006) concur, stating that student commentary should be recorded as soon after the event as possible to prevent the distortions of information. The method used to collect this information, however, needs to be as unobtrusive as possible, or it could inject a researcher effect that might bias the results (Miles & Huberman, 1994).

Second, future studies should focus on the students’ need for practice in using self-regulatory strategies. Rachal, Daigle and Rachal (2007) support this view, stating that for students to develop a repertoire of effective learning strategies, they must receive clear precise instructions about what needs to be done and be given opportunities to practice and apply those skills. The authors also emphasized that learners in environments that contained frequent opportunities for practice and feedback and where the strategies were effectively modeled more readily incorporated these strategies.

Third, future studies should focus on the importance of student choice. Knowing what cognitive strategies students choose is important in determining
the quality of the self-regulatory process, but it is not sufficient, because one also needs to know whether students perceive that there is a choice between the options they have available (Boekaerts, 1999). Students can only adapt a particular strategy to a given context if they are aware that alternative strategies exist. Otherwise, they may use the same strategy, whether it is effective or not, irrespective of the context.

Fourth, future research should incorporate the newer version of the MSLQ. The newer version of the MSLQ now includes 81 items, comprising 6 motivational subscales including: (a) intrinsic goal orientation, (b) extrinsic goal orientation, (c) task value, (d) control of learning beliefs, (e) self-efficacy for learning and performance, and (f) test anxiety; and 9 learning strategy scales including: (a) rehearsal, (b) elaboration, (c) organization, (d) critical thinking, (e) metacognitive self-regulation, (f) time and study environment management, (g) effort regulation, (h) peer learning, and (i) help seeking (Duncan & McKeachie, 2005). The newer MSLQ would be more flexible than the version used in this study because any of the fifteen subscales could be used singly or in any combination that the researcher chooses. Future studies might also benefit by incorporating the learning strategy scales that could give researchers a clearer picture of what the students’ perception is and serve as a complement to the data gathered during the classroom videorecordings.

Finally, a longer-term study in several classrooms would be useful in determining whether or not the findings can be generalized across diverse educational settings. The classrooms observed during this study varied in content, grade level, and location of the school, but the sample size was small. Increasing the scope of the study would provide further evidence as to whether
or not higher levels of implementation of the Five Standards produces increases in student self-regulatory behavior in a variety of diverse settings.

There are eight limitations that may affect future research on this topic. First, there is a limitation related to my role as researcher. The possible effects of my position are discussed in the Role of the Researcher section in Chapter 3, and while I made the utmost effort to minimize any potential negative consequences, it is difficult to know how much my role affected student behavior during the classroom observations and the interpretation of the results. Incorporating five suggestions proposed by Miles and Huberman (1994) helped me to minimize these effects. I used unobtrusive measures to minimize disruptions and decrease the likelihood that the subjects were unduly influenced. I made my intentions clear to all parties involved to minimize any potential misunderstanding and to give all parties the information necessary to make independent choices. I tried to keep a conceptual frame of reference to minimize any sentimental or interpersonal thoughts that could unintentionally bias the results. I used multiple data sources to triangulate my findings, which indicated a convergence of support for my results. Finally, I invited a colleague to examine my procedures and data to confirm that I was not being misled.

Second, the survey results might have been biased due to the students’ less than perfect recall of past events (Perry & Winne, 2006). Asking students what they were thinking immediately after they exhibited a self-regulatory behavior could have alleviated this problem, but the potentially disruptive consequences of this action outweighed the benefits that would have been gained by having this information. For this study, the triangulated results
indicated agreement between data sources, offering support that the students’ responses to the survey questions were accurate.

Third, there may be other factors affecting the students’ increased use of self-regulatory strategies. For example, there may be an effect due to the subject area. In this study, the middle school students were all recruited from their science classrooms taught by one particular teacher and the high school students were members of Hawaiian language and social studies classes. Future research can include a more systematic sampling of different subject areas to determine if there is a subject area effect that promotes the use of self-regulatory strategies among middle and high school students.

There may also be an effect due to the nature of the activity that the students are involved in. For example, students in a lecture-based activity would likely show less self-regulatory behavior than those involved in a discovery-based science lab due to limited opportunity. Future studies would need to address the type of activity in which students were involved to differentiate whether it is the implementation of the Five Standards or other aspects of activity that can be attributed to increases in self-regulatory behavior.

The increased use of self-regulatory strategies could also be attributed to the students’ or teachers’ developmental growth rather than the teacher implementation of the Five Standards. More specifically, students would be expected to develop more skills as the school year progressed, therefore, it may be this development, rather than the implementation of the Five Standards that is responsible of the increased use of self-regulatory strategies. Similarly, teacher would also be expected to become more proficient as the school year progressed, perhaps due to the professional development they were receiving. Thus, it may
be this increased competence that may or may not be related to their use of the Five Standards that promoted the students’ increased use of self-regulatory strategies. Future research would need to control for these possibilities.

The students’ cultural background may also be contributing to the students’ willingness to use self-regulatory strategies. Olaussen and Braten (1999) suggest that students who come from individualistic cultures were more likely to adopt different self-regulatory strategies than students from collectivist cultures. Future studies could examine the potential contribution of the students’ ethnicity and culture to student adoption of self-regulatory strategies, relative to influences that can be attributed to teachers’ use of the Five Standards.

It may also be that students from groups that are more reticent to adopt self-regulation may be the ones who can benefit the most from teachers’ use of the Five Standards to promote such strategies.

Fourth, the qualitative component of this study focused on the small group as the unit of analysis. Therefore, determining whether or not individual students were increasing the use of self-regulatory strategies in either frequency or type was not possible. Future studies should look at the student as the unit of analysis to obtain a clearer view of how the implementation of the Five Standards is related to the increased use of self-regulatory strategies at the individual student level.

Fifth, results may be biased due to the small sample size. The original plan for this study was to analyze subject area and grade level. However, the small sample size did not provide enough data to thoroughly analyze the subject areas, leaving grade level as the only component I could effectively study. Future research should attempt to include more people, both students and
teachers, which would allow the researcher to do a multilevel analysis that would help make the study one that can be generalized across more settings.

Sixth, there is a limitation, mentioned in each of the videorecording sections, due to the equipment. In this study, the number of cameras and microphones was limited. Having multiple cameras and microphones would provide additional views and clearer audio of the events. These multiple views would make transcribing and analyzing the data much easier because one camera might catch an event that was missed by another and additional microphones would decrease the likelihood that audio would be unintelligible. Some examples in this study were eliminated because there was good video recording of an event, but no audio confirmation of what was said, and similarly, other examples were eliminated because although the audio was good, the camera did not capture video that could have been used to confirm what was said. One solution to this problem would be to increase the number of cameras and to use lavalier microphones on each of the subjects. While this would likely provide the clearest recordings, the intrusiveness of this solution needs to be considered. If students are confronted with wearing a lavalier microphone and are faced with multiple cameras, their behavior may be subject to the Hawthorne effect, where their behavior changes simply because they are being watched.

Seventh, there is a limitation related to the limited application of the Instructional Conversation standard. The teachers were observed during their first year of Professional Development and had not yet received any coaching on how to improve their practice. They were not familiar with the components that make up a high level Instructional Conversation or with the pedagogical practices needed to achieve it. This lack of familiarity is a possible reason why
the conversations that they engaged in with their students were “Level 2” conversations, rather than the higher “Level 3” conversations.

Finally, there is a limitation related to the generalizability of these findings to other classrooms or learning environments. Students in this study were members of a larger group that was being videorecorded for a broader project. This familiarity with the observational process probably had some effect on student behavior. That is, the students in this study were more likely to be comfortable with being videorecorded than a randomly chosen group of students would have been. Students confirmed this fact, saying that they were initially mindful of the videorecorders and observers, but that as time went on, they didn’t think about them anymore. This comfort level with having observers in the classroom might have allowed the students to react in a more natural way than if they were concerned with being watched, allowing them to freely choose from the self-regulatory strategies available to them. Whereas the students’ comfort level with the observers and videorecording equipment may have led to less reactivity in the current study, students in future studies may be more conscious of the observers and videorecording equipment and may behave differently. Therefore, the results of this study may differ from that of future studies.

While the findings of this study showed that higher-level implementation of the Five Standards was associated with increased student use of self-regulatory behaviors, it is impossible to predict what results will come from trying to replicate or extend this research. A new study would inevitably have a number of different characteristics, including but not limited to the teachers, students, location, methods of Five Standard implementation, and coders. These
unavoidable differences from the original study highlight the need to be
judicious when attempting to generalize the results obtained here to other similar
educational situations.
Appendix A

Hui 1 Teacher (Grades 5-12) Consent Form

CREDE Professional Development

Lois A. Yamauchi, Ph.D.
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The purpose of this project is to highlight, develop, and evaluate use of the Center for Research on Education, Diversity, and Excellence (CREDE) Standards for Effective Teaching and Learning, principles of effective instruction for culturally and linguistically diverse students. The project involves professional development for teachers who work in schools with large concentrations of Native Hawaiian students and an evaluation of the effects of those efforts on teachers’ knowledge and instruction and on students’ self-regulated learning.

You will be asked to participate in professional development activities provided as two courses, EDEP 411 and EDEP 768C, over two academic years. EDEP 411 will be provided during the 2007-2008 academic year, and EDEP 768C will occur during the 2008-2009 year. The objectives of both courses are to promote your use of the CREDE Standards in lesson planning and instruction. Each year, your participation will involve attending a 3-day meeting, 2 full-day workshops, and bi-monthly videoconference meetings.

As part of the two courses, you will develop two lesson plans each year that will be assessed to determine the extent to which they incorporate the CREDE Standards.

Throughout the two years, project researchers will observe, videotape and photograph you while you are teaching and while you are participating in the professional development activities. Researchers will analyze the video recordings of the professional development meetings to study your attitudes toward, knowledge of, and strengths and weaknesses in implementing the CREDE Standards.

Other teacher participants will review your lesson plans and observe your videotaped instruction. You will be asked to observe and analyze your own lesson plans and instruction. Your involvement in EDEP 768C will include coaches observing your live and videotaped classroom instruction and your participation in discussions with the coaches about how you could increase use of the CREDE Standards.

You will be asked to complete a demographic survey at the beginning of EDEP 411. You will also be asked to complete a survey about your attitudes toward and the teaching practices you use to incorporate the CREDE Standards. You will be
asked to complete the survey three times, once before professional development activities begin and at the ends of the 2007-2008 and 2008-2009 academic years.

Your educational practices will be assessed by a teacher observation protocol. The protocol will be used to rate your videotaped instruction throughout the 2007-2008 and 2008-2009 school years. You will be videotaped approximately four times each year. You will be informed of the videotaping on the morning that it is scheduled. Unless you specify otherwise, your identity, with regard to these assessments, will be kept confidential, as allowable by law. The assessments will only be used for research purposes.

The classroom discussions that appear in your videotaped instruction will also be analyzed to determine the extent to which students demonstrate that they are taking responsibility during these conversations. The discussions will be transcribed and coded for indications of your regulation of the conversations, students’ regulation, and co-regulation by you and the students. The conversations will also be coded to determine the extent to which the content of the discussions is focused on subject-oriented information or more procedural and directive statements about what students should be doing.

Videotaped and audiotaped recordings and observations of you and your students will be used to create a DVD of educational practices that incorporate the CREDE Standards, for journal articles, conference presentations, and other publications written about the project. The DVD will be widely distributed nationally to teachers and researchers who are interested in learning about CREDE. Photographs of you and your students will be used in research presentations and for program brochures and websites. All tapes and digital images will be stored in Dr. Yamauchi’s office.

Your participation is voluntary. You may choose to stop participating in the research at any time without prejudice or penalty. You may stop participating in the research and can still remain in the courses. If you decide to stop participating in the research in the first year, you will be allowed to take the second course, if you receive a grade of B or better in the first one.

You may benefit from participating in this project by receiving professional development. Although there are no other direct benefits to your participation, the information gathered in this project may help other teachers and researchers understand how to better instruct Hawaiian and other culturally diverse students.

Research Participation:

I have read and understand the information above. My questions about project procedures and other matters have been answered to my satisfaction. I know that I can withdraw my participation at any time without consequence.
I agree to participate in this project. I understand that by agreeing to participate, I have not given up any legal rights and that the researchers and the institutions they represent are still responsible for upholding all laws that apply.

_________________________     ___________________________
Signature of Participant            Print name            Date

Video and Photo Release:

I agree to allow video recordings and audio recordings made of me for the above project to be reproduced on a DVD about the CREDE Standards. I understand that the videotape will be distributed nationally for those who are interested in learning more about CREDE. I agree to allow photographs of me to be used for research presentations and for program brochures and websites.

_________________________         ____________________
Signature of Participant                Print name              Date

(If you do not receive satisfactory answers to your questions or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822. Phone: (808) 956-5007. Email: uhirb@hawaii.edu)

cc: participant            Hui 1 teacher (Grades 5-12) consent form 07/26/07
Appendix B

Adult Student Consent Form

CREDE Professional Development

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The purpose of this project is to highlight, develop, and evaluate use of the Center for Research on Education, Diversity, and Excellence (CREDE) Standards for Effective Teaching and Learning, principles of effective instruction for culturally and linguistically diverse students. The project involves professional development for teachers who work in schools with large concentrations of Native Hawaiian students and an evaluation of the effects of those efforts on teachers’ knowledge and practice. The researchers are also interested in what motivates students in school and what students do to help themselves learn.

You will be observed, videotaped, and photographed while participating in (teacher’s name) class during the 2007-2008 (or 2008-2009) academic year. Researchers will analyze the videotapes to determine whether your teacher’s instruction changes over the school year. The classroom discussions that appear on these videotapes will be analyzed to determine students’ and teachers’ contributions to these conversations. The conversations will also be coded for their content.

Videotaped and audiotaped recordings and observations of you will be used to create a DVD of educational practices that incorporate the CREDE Standards, for journal articles, conference presentations, and other publications written about the project. The DVD will be widely distributed nationally to teachers and researchers who are interested in learning about CREDE. Photographs of you will be used in research presentations and for program brochures and websites. All tapes and digital images will be stored in Dr. Yamauchi’s office.

At the beginning, middle, and end of the school year, you will also be asked to complete a survey about your motivation in school and the strategies you use when completing school assignments. The survey will take approximately 15 minutes to complete.

Your participation is voluntary. You may choose to stop your participation at any time without prejudice or penalty.

There are no direct benefits to your participation in this project. However, the information gathered may improve instruction at your school and help other
teachers and researchers understand how to teach students from different cultural backgrounds.

Research Participation:

I have read and understand the information above. My questions about project procedures and other matters have been answered to my satisfaction. I know that I can withdraw my participation at any time without consequence.

I agree to participate in this project. I understand that by agreeing to participate, I have not given up any legal rights and that the researchers and the institutions they represent are still responsible for upholding all laws that apply.

Signature of student
Print name
Age
Date

Video and Photo Release:

I agree to allow video and audio recordings made of me for the above project to be reproduced on a DVD about the CREDE Standards. I understand that the videotape will be distributed nationally for those who are interested in learning more about CREDE. I agree to allow photographs of me to be used for research presentations and for program brochures and websites.

Signature of student
Print name
Age
Date

(If you do not receive satisfactory answers to your questions or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822. Phone: (808) 956-5007. Email: uhirb@hawaii.edu)

cc: participant

adult student consent form 06/20/07
Appendix C

Student (Grades 5-12) Assent Form

CREDE Professional Development

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The purpose of this project is to help teachers teach students who are from
different cultural backgrounds. The researchers are also interested in what
motivates students in school and what students do to help themselves learn.

You will be observed, videotaped, and photographed while in (teacher’s name)
class during this school year. Researchers will look at the videotapes to see how
your teacher teaches. Researchers will also look at videotapes of class discussions
to figure out who talks and what they talk about.

The videotapes will be used to create a DVD for other teachers and researchers.
The photographs of you will be shown to other researchers and will be used for
program brochures and websites.

Three times this year, you will be asked to complete a questionnaire about what
you think about school and what you do when completing school assignments. It
should take you about 15 minutes to complete the survey.

It is up to you whether you want to participate in this project, and you can stop
participating at any time.

This project may help other teachers learn about how to best teach students from
different cultures.

Research Participation:

I understand that this is a research study. The research procedures have been explained
to me. I have been told about what I will do or what will happen to me. I agree to be a
part of this study.
Video and Photo Release:

I agree to let the researchers use the video recordings of me to make a DVD about the project that many other people will see. I agree to let the researchers use photographs of me on brochures and websites about the project.

(If you do not receive satisfactory answers to your questions or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822. Phone: (808) 956-5007. Email: uhirb@hawaii.edu)

cc: student

student (Grades 5-12) assent form 07/08/07
Appendix D

Parent/Guardian Consent Form (Grades 5-12)

CREDE Professional Development

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The purpose of this project is to highlight, develop, and evaluate use of the Center for Research on Education, Diversity and Excellence (CREDE) Standards for Effective Teaching and Learning, principles of effective instruction for culturally and linguistically diverse students. The project involves professional development for teachers who work in schools with large concentrations of Native Hawaiian students and an evaluation of the effects of those efforts on teachers’ knowledge and practice and students’ motivation and ability to regulate their learning.

Your child will be asked to be observed, videotaped, and photographed while participating in (teacher’s name) class during the 2007-2008 (or 2008-2009) academic year. Researchers will analyze the videotapes to determine whether the teacher’s instruction changes over the school year. The classroom discussions that appear on these videotapes will be analyzed to determine students’ and teachers’ contributions to these conversations. The conversations will also be coded for their content.

Videotaped and audiotaped recordings and observations of your child will be used to create a DVD of educational practices that incorporate the CREDE Standards, for journal articles, conference presentations, and other publications written about the project. The DVD will be widely distributed nationally to teachers and researchers who are interested in learning about CREDE. Photographs of your child will be used in research presentations and for program brochures and websites. All tapes and digital images will be stored in Dr. Yamauchi’s office.

At the beginning, middle, and end of the school year, your child will also be asked to complete a survey about his/her motivation in school and the strategies he/she uses when completing school assignments. The survey takes approximately 15 minutes to complete.

Your child’s participation is voluntary. You may choose to stop your child’s participation at any time without prejudice or penalty.

There are no direct benefits to your child’s participation in this project. However, the information gathered may improve educational services at your
child’s school and help other teachers and researchers understand how to better instruct culturally diverse students.

Research Participation:

I have read and understand the information above. My questions about project procedures and other matters have been answered to my satisfaction. I know that I can withdraw my child’s participation at any time without consequence.

I consent to the participation of my child, __________________________, in this project. I understand that by agreeing to my child’s participation, I have not given up any legal rights and that the researchers and the institutions they represent are still responsible for upholding all laws that apply.

_________________________     ________________________     __________
Signature of Parent or Guardian          Print name          Date

Video and Photo Release:

I agree to allow video and audio recordings made of my child for the above project to be reproduced on a DVD about CREDE. I understand that the videotape will be distributed nationally for those who are interested in learning more about CREDE. I agree to allow photographs of my child to be used for research presentations and for program brochures and websites.

_________________________     ________________________     __________
Signature of Parent or Guardian          Print name          Date

(If you do not receive satisfactory answers to your questions or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822. Phone: (808) 956-5007. Email: uhirb@hawaii.edu)

cc: parent/guardian          parent/guardian (Grades 5-12) consent form 07/08/07
Appendix E: Standards Performance Continuum (SPC)

A Rubric for Observing Classroom Enactments of CREDE’s Standards for Effective Pedagogy


<table>
<thead>
<tr>
<th>General Definition:</th>
<th>NOT OBSERVED</th>
<th>EMERGING</th>
<th>DEVELOPING</th>
<th>ENACTING</th>
<th>INTEGRATING</th>
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</thead>
<tbody>
<tr>
<td>The standard is not observed.</td>
<td>One or more elements of the standard are enacted.</td>
<td>The teacher designs and enacts activities that demonstrate a partial enactment of the standard.</td>
<td>The teacher designs, enacts, and assists in activities that demonstrate a complete enactment of the standard.</td>
<td>The teacher designs, enacts, and assists in activities that demonstrate skillful integration of multiple standards simultaneously.</td>
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| Joint Productive Activity Teacher and Students Producing Together | Joint Productive Activity is not observed. | Students are seated with a partner or group, AND (a) collaborate or assist one another, OR (b) are instructed in how to work in groups, OR (c) contribute individual work, not requiring collaboration, to a joint product. | The teacher and students collaborate on a joint product in a whole-class setting, OR students collaborate on a joint product in pairs or small groups. | The teacher and a small group of students collaborate on a joint product. | The teacher designs, enacts, and collaborates in joint productive activities that demonstrate skillful integration of multiple standards simultaneously. |

| Language & Literacy Development | Language & Literacy Development is not observed. | (a) The teacher explicitly models appropriate language; OR (b) students engage in brief, repetitive, or drill-like reading, writing, or speaking activities; OR (c) students engage in social talk while working. | The teacher provides structured opportunities for academic language development in sustained reading, writing, or speaking activities. | The teacher designs and enacts instructional activities that generate language expression and development of content vocabulary, AND assists student language use or literacy development through questioning, rephrasing, or modeling. | The teacher designs, enacts, and assists in language development activities that demonstrate skillful integration of multiple standards simultaneously. |

<p>| Contextualization Making Meaning – Connecting School to Students’ Lives | Contextualization is not observed. | The teacher (a) includes some aspect of students’ everyday experience in instruction, OR (b) connects classroom activities by theme or builds on the current unit of instruction, OR (c) includes parents or community members in activities or instruction. | The teacher makes incidental connections between students’ prior experience/knowledge from home, school, or community and the new activity/information. | The teacher integrates the new activity/information with what students already know from home, school, or community. | The teacher designs, enacts, and assists in contextualized activities that demonstrate skillful integration of multiple standards simultaneously. |</p>
<table>
<thead>
<tr>
<th>Complex Thinking</th>
<th>NOT OBSERVED</th>
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<th>DEVELOPING</th>
<th>ENACTING</th>
<th>INTEGRATING</th>
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</thead>
<tbody>
<tr>
<td>Complex Thinking is not observed.</td>
<td>The teacher (a) accommodates students' varied ability levels, OR (b) connects student comments to content concepts, OR (c) sets and presents standards for student performance, OR (d) provides students with feedback on their performance.</td>
<td>The teacher designs and enacts activities that connect instructional elements to academic content OR advance student understanding to more complex levels*.</td>
<td>The teacher designs and enacts challenging activities with clear standards and performance feedback, AND assists* the development of more complex thinking.</td>
<td>The teacher designs, enacts, and assists in challenging activities that demonstrate skillful integration of multiple standards simultaneously.</td>
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</table>

| Instructional Conversation Teaching Through Conversation | Instructional Conversation is not observed. | With individuals or small groups of students, the teacher (a) responds in ways that are comfortable for students, OR (b) uses questioning, listening or rephrasing to elicit student talk, OR (c) converses on a nonacademic topic. | The teacher converses with a small group of students on an academic topic AND elicits student talk with questioning, listening, rephrasing, or modeling. | The teacher: designs and enacts an instructional conversation (IC) with a clear academic goal*; listens carefully to assess and assist student understanding; AND questions students on their views*, judgments, or rationales. Student talk occurs at higher rates than teacher talk. | The teacher designs, enacts, and assists in instructional conversations that demonstrate skillful integration of multiple standards simultaneously. |

| Modeling Learning Through Observation | Modeling is not observed. | The teacher, or student, models a process but does not provide an opportunity for students to practice. | (a) The teacher provides a model of a finished product that students will make or (b) the teacher, or student, explicitly models behaviors, thinking processes, or procedures which students then practice. | (a) The teacher provides a model of a finished product that students will make or (b) the teacher, or student, explicitly models behaviors, thinking processes, or procedures which students then practice. The teacher assists students while they practice. | The teacher designs, enacts, and assists in modeling activities that demonstrate skillful integration of multiple standards simultaneously. |

| Student Directed Activity Exchange Student Decision Making | Student Directed Activity is not observed. | Students (a) choose the subject or topic for an assigned task, OR (b) take an active teaching or evaluation role with self or peers. | Students select from among activities generated by the teacher. | Students participate in the generation of learning topics or activities. | The teacher designs, enacts, and assists in student directed activities that demonstrate skillful integration of multiple standards simultaneously. |
Appendix F: SPC Glossary of Terms


**Academic goal:** In an Instructional Conversation, the academic goal is the development of thematic or conceptual understanding.

**Assistance:** Assistance is a two part process in which the teacher first assesses student knowledge and skills, then responsively assists development. Types of assistance may include: (a) Modeling -- Providing a demonstration; (b) Feeding Back -- Providing information about student performance as compared with a standard; (c) Contingency Management: -- Providing rewards or punishments contingent on student performance; (d) Questioning -- Providing questions that guide students to advance their understanding; (e) Instructions -- Providing clear verbal directions for performance; (f) Cognitive Structuring -- Providing explanations or rules for proceeding; or (g) Task Structuring -- Providing assistance by segmenting or sequencing portions of the task.

**Complex Thinking Activities - Activities that advance student understanding to more complex levels:** (a) the ‘why’ is addressed, not merely the ‘what’ or the ‘how to;’ (b) the activity requires that students generate knowledge, or use or elaborate on information provided (apply, interpret, categorize, order, evaluate, summarize, synthesize, analyze, explore, experiment, determine cause and effect, formulate and solve problems, explore patterns, make conjectures, generalize, justify, make judgments); (c) the teacher connects the content or activity to a broader concept or abstract idea to advance student understanding; or (d) the teacher provides instruction in critical thinking, or problem solving or metacognitive strategies.

**Collaboration:** Joint activity that results in shared ownership, authorship, use, or responsibility for a product. It can also include division of labor for coordinated sub-sections. However, mere turn taking does not constitute division of labor and, to be considered collaboration, an activity must include interaction between participants. Coordinated activities such as morning calendar, round robin reading, choral responses or calisthenics are rated at the Emerging level for JPA.

**Content vocabulary:** Language development may occur in the context of literacy or English language lessons. Therefore, we broadly define content vocabulary to include (a) academic language use in literacy lessons, or (b) standard English language when that is the goal of instruction.

**Instructional Conversation (IC):** ICs are inclusive of all participants whose contributions are connected to, or extend, the comments and ideas of other participants. In contrast, directed-discussions focus less on developing conceptual understanding and more on known-answer questions and skill development. Instructional conversation focuses on broad topics, main ideas, themes or concepts, is responsive to student contributions, includes participation structures that are familiar to students, and includes open-ended questions and sustained dialogue on a single topic. A precondition or precursor of conversation is discourse between teacher and student(s) that is extended to at least two speech turns each, with each turn consisting of more than just providing an answer or providing a fact (responses to convergent teacher questions).

**Incidental connections:** The teacher (a) makes connections between students’ experience or knowledge from home, school, or community and the new activity/information on an ad hoc basis to assist understanding, or (b) prompts students to make connections.

**Integrates the new activity/information with what students already know from home, school, or community:** (a) students’ knowledge or experience is integrated with new
information, (b) the basis of the activity is personally relevant to students' lives; or (c) students apply school knowledge in an authentic activity.

**Integration:** A single activity integrating three or more standards at the enacting level.

**Product:** Products may be tangible or intangible. Examples of tangible products: worksheet, essay, report, pottery, word-web, a math problem solved on the blackboard, play, skit, game, debate. Intangible products may be found in such activities as 'story time,' introductory lectures, or some ICs (the product is an accurate or elaborated understanding of a concept, procedure, idea), or some PE activities (increased physical fitness is the product, though not joint). The intangible products are an achieved physical, psychological, or social state that integrates a series of actions.

**Standards for student performance:** performance standards go beyond what to do and address the quality of student work. Standards may be in the form of a checklist or a rubric, or may be implicitly expressed through teacher expectations.

**Students' views (questions students on their views):** In an Instructional Conversation, questioning students on their views is inclusive of students' prior knowledge or experience related to the goal of the conversation.
## Appendix G: SPC Observation Form

Doherty, Hilberg, Epalooose & Tharp (2002)

<table>
<thead>
<tr>
<th>Teacher</th>
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**JPA:** Joint Productive Activity  
**CTX:** Contextualization  
**IC:** Instructional Conversation  
**SDA:** Student Directed Activity  

**LLD:** Language and Literacy Development  
**COT:** Complex Thinking  
**MD:** Modeling

182
Appendix H: SPC Observation Summary


<table>
<thead>
<tr>
<th>Teacher</th>
<th>Observer</th>
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</table>
Appendix I: Observation Instrument for Documenting Students’ Self-Regulated Learning Behaviors (Classroom)

Perry (1998)

Section A

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<td>Start/End Time:</td>
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Section B

Running Record

Section C

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<td>Selectively Monitoring Performance for signs of Progress</td>
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<td>Restructuring the Physical and Social Context to make it compatible to the goals</td>
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<td>Managing Time Efficiently</td>
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# Appendix J

## Observation Instrument for Documenting Students’ Self-Regulated Learning Behaviors (Videorecordings)

<table>
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| Adapting  | Self-Experimentation  
            | Make adjustments to Progress |
Appendix K: MSLQ Survey

Pintrich and DeGroot (1990)

ID #: ____________________

MSLQ Questionnaire

Part A. Motivation

The following questions ask about your motivation for and attributes about this class. Remember there are no right or wrong answers. Answer the questions about how you study in the class as accurately as possible. Use the scale below to answer the questions. If you think the statement is very true of you, choose 7; if a statement is not at all true of you, choose 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

1 = not at all true of me  2  3  4  5  6  7 = very true of me

1. I prefer class work that is challenging so I can learn new things. ○1  ○2  ○3  ○4  ○5  ○6  ○7

2. Compared with other students in this class I expect to do well. ○1  ○2  ○3  ○4  ○5  ○6  ○7

3. I am so nervous during a test that I cannot remember facts I have learned. ○1  ○2  ○3  ○4  ○5  ○6  ○7

4. It is important for me to learn what is being taught in this class. ○1  ○2  ○3  ○4  ○5  ○6  ○7

5. I like what I am learning in this class. ○1  ○2  ○3  ○4  ○5  ○6  ○7

6. I’m certain I can understand the ideas taught in this course. ○1  ○2  ○3  ○4  ○5  ○6  ○7

7. I think I will be able to use what I learn in this class in other classes. ○1  ○2  ○3  ○4  ○5  ○6  ○7

8. I expect to do very well in this class. ○1  ○2  ○3  ○4  ○5  ○6  ○7
9. Compared to others in this class, I think I’m a good student.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

10. I often choose paper topics I will learn something new from even if they require more work.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

11. I am sure I can do an excellent job on the problems and tasks assigned for this class.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

12. I have an uneasy, upset feeling when I take a test.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

13. I think I will receive a good grade in this class.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

14. Even when I do poorly on a test I try to learn from my mistakes.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

15. I think that what I am learning in this class is useful for me to know.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

16. My study skills are excellent compared with others in this class.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

17. I think that what we are learning in this class is interesting.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

18. Compared with other students in this class I think I know a great deal about the subject.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

19. I know that I will be able to learn the material from this class.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

20. I worry a great deal about tests.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

21. Understanding this subject is important to me.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7

22. When I take a test I think about how poorly I am doing.  ○ 1  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7
Part B. Learning Strategies

The following questions ask about your motivation for and attributes about this class. Remember there are no right or wrong answers. Answer the questions about how you study in the class as accurately as possible. Use the scale below to answer the questions. If you think the statement is very true of you, choose 7; if a statement is not at all true of you, choose 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

1 = not at all true of me  2  3  4  5  6  7 = very true of me

23. When I study for a test, I try to put together the information from class and from the book.

24. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.

25. I ask myself questions to make sure I know the material I have been studying.

26. It is hard for me to decide what the main ideas are in what I read.

27. When work is hard I either give up or study only the easy parts.

28. When I study I put important ideas into my own words.

29. I always try to understand what the teacher is saying even if it doesn’t make sense.

30. When I study for a test I try to remember as many facts as I can.

31. When studying, I copy my notes over to help me remember the material.
32. I work on practice exercises and answer end of chapter questions even when I don’t have to.

33. Even when study materials are dull and uninteresting, I keep working until I finish.

34. When I study for a test I practice saying the important facts over and over to myself.

35. Before I begin studying I think about the things I will need to do to learn.

36. I use what I have learned from old homework assignments and the textbook to do new assignments.

37. I often find that I have been reading for class but don’t know what it is all about.

38. I find that when the teacher is talking I think of other things and don’t really listen to what is being said.

39. When I am studying a topic, I try to make everything fit together.

40. When I’m reading I stop once in a while and go over what I have read.

41. When I read material for this class, I say the words over and over to myself to help me remember.

42. I outline chapters in my book to help me study.

43. I work hard to get a good grade even when I don’t like a class.

44. When reading I try to connect things I am reading about with what I already know.
### Appendix L: MSLQ Items by Construct

Pintrich & Degroot (1990)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item #</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic</td>
<td>1.</td>
<td>I prefer class work that is challenging so I can learn new things.</td>
</tr>
<tr>
<td>Value</td>
<td>4.</td>
<td>It is important for me to learn what is being taught in this class.</td>
</tr>
<tr>
<td></td>
<td>5.</td>
<td>I like what I am learning in this class.</td>
</tr>
<tr>
<td></td>
<td>7.</td>
<td>I think I will be able to use what I learn in this class in other classes.</td>
</tr>
<tr>
<td></td>
<td>10.</td>
<td>I often choose paper topics I will learn something new from even if they require more work.</td>
</tr>
<tr>
<td></td>
<td>14.</td>
<td>Even when I do poorly on a test I try to learn from my mistakes.</td>
</tr>
<tr>
<td></td>
<td>15.</td>
<td>I think that what I am learning in this class is useful for me to know.</td>
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<td>17.</td>
<td>I think that what we are learning in this class is interesting.</td>
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<td></td>
<td>21.</td>
<td>Understanding this subject is important to me.</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>2.</td>
<td>Compared with other students in this class I expect to do well.</td>
</tr>
<tr>
<td></td>
<td>6.</td>
<td>I’m certain I can understand the ideas taught in this course.</td>
</tr>
<tr>
<td></td>
<td>8.</td>
<td>I expect to do very well in this class.</td>
</tr>
<tr>
<td></td>
<td>9.</td>
<td>Compared to others in this class, I think I’m a good student.</td>
</tr>
<tr>
<td></td>
<td>11.</td>
<td>I am sure I can do an excellent job on the problems and tasks assigned for this class.</td>
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|                 | 18.    | Compared with other students in this class I think I know
19. I know that I will be able to learn the material from this class.

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<th>3. I am so nervous during a test that I cannot remember facts I have learned.</th>
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| Self-Regulation 25. | I ask myself questions to make sure I know the material I... |
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40. When I’m reading I stop once in a while and go over what I have read.

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REFERENCES


*Theory into Practice, 41*(2), 64-70.

