THE COLLABORATIVE RESIDENCY PROJECT:
THE INFLUENCE OF CO-TEACHING ON PROFESSIONAL DEVELOPMENT
IN ARTS INTEGRATION

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ABSTRACT

This qualitative case study examined teachers’ professional growth in integrating the arts in an attempt to extend our knowledge about influencing factors from a collaborative work relationship with a teaching artist. Teacher and student interviews, as well as instructional observations explore teachers’ perspectives on integrating the arts in their science curriculum. Consistent with the literature, participants in this study supported the educational advantages of teaching through the arts to help students acquire, deepen and construct understanding. The results highlight the interdependence of teachers’ personal beliefs, behaviors, and the environment they teach in, as well as effects on teachers’ professional development, and the need for better institutional support to provide teachers a ground on which they can continue their endeavors. (119)
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CHAPTER I Introduction

In the U.S., schools are requiring more and more testing to document educational outcomes (Bracey, 2006). Teaching for testing is often teaching for the recall of established facts. It does not equip students with the knowledge and competencies needed for future problem solving behaviors (Winner & Hetland, 2007). Other problems in today’s schools include low achievement, high levels of boredom, and alienation (Fredricks, 2011). Bored and alienated students are more difficult to teach than those who are engaged. Teachers are struggling to educate students who are trying to maneuver through school with as little effort as possible. This is troublesome in a fast-changing economy that requires critical thinking and problem-solving from workers in all sectors.

Trends initiated by the No Child Left Behind Act (U.S. Congress, 2001) continue to include testing, and the arts often get cut from the curriculum. Often regarded as unimportant, the arts are marginalized because testing emphasizes core subjects such as math, science, reading and writing. In this age of accountability, the arts are often reduced to help students remember content in tested subjects (Mishook & Kornhaber, 2006) or reduced to decorative frills to brighten a hallway (LaJevic, 2006).

At the same time, research findings concerning the benefits of arts in schools range from increases in standardized test scores, higher graduation rates, better overall attendance and positive school attitudes (Catterall 2009; Brandon, Lawton & Krohn-Ching, 2007; Smithrim & Upitis 2005). Some explain correlations with academic gain by theorizing that learning through your body, as in dance and drama, supports cognitive development (Gazzaniga, 2008). Other scholars entertain the possibility that teaching through the arts could be an entry point to learning
(Catterall, Dumais & Hampden-Thompson, 2012; Eckhoff, 2013; Gullat, 2008; Melnick, Witmer & Strickland, 2011). For example, arts integration can be an attention catcher to pique students’ interest in a topic. Increasing student engagement is becoming a strategy for addressing the problem of alienation and boredom in school, and school engagement is an explicit goal of many school reforms (Wang & Eccles, 2013).

Researchers often emphasize how arts teach persistence, creative problem solving and provide hands-on experiences. Simpson Steele (2013) revealed ways in which arts integration supports an academic mindset, learning strategies, social skills and interpersonal behaviors. The arts teach students to ask questions: Are there new patterns to be seen? How can I learn from my mistakes? What is my vision? What could a solution look like? Through the arts, other modes of thinking are activated; the arts teach vital ways of seeing, imagining, inventing, and engaging tomorrow’s citizens in creative problem solving (Winner & Hetland, 2007). Creativity is a major tenet of innovative technology (Wynn & Harris, 2012) and as a conduit to that end, the arts are currently getting more attention in the realm of science education. STEM (Science, Technology, Engineering, and Mathematics) programs are integrating the arts by becoming STEAM (Science, Technology, Engineering, Art and Mathematics) programs.

The arts carry tremendous potential for supporting student learning, but teachers are often ill equipped to provide meaningful arts instruction. Educators look to professional development to help teachers incorporate research supported practices as they adapt to new challenges in teaching. Experiences that incorporate the hallmarks of effective professional development could have a powerful effect on the way teachers integrate the arts in their classrooms.

Professional Development is a method to help teachers adapt to new challenges in teaching. Darling-Hammond and Friedlaender (2008) mentioned the importance of collaboration
for successful school development, and research shows that collaboration has a supportive contribution in professional development (Powell-Moman & Brown-Schild, 2011). Universities, arts institutions and other professional institutions have engaged teachers in partnerships to guide professional development or to support school life (Rice, 2002; Thomas, Hassaram, Rieth et al., 2002).

The literature about change in teaching practices implies that teachers need to experience improvement in student behavior or academic progress in order to manifest and adapt change in their teaching practices (Orek, 2004; Guskey, 1985). However, to encourage new forms of teaching, professional development has to acknowledge the personal beliefs of teachers. These beliefs guide teachers’ content preparation and have a powerful influence on teaching practice and classroom culture; successful and sustainable professional development needs to commit to a change in teachers’ beliefs in order to meet students’ learning challenges (Guskey, 1985).

**Collaborative Residency Project**

The Honolulu Theatre for Youth (HTY) conducts the *Collaborative Residency project* annually. Support and funding came from the Hawai‘i Community Foundation (HCF), State Foundation on Culture and the Arts (HSFCA), and Hawai‘i Arts Alliance (HAA). In cooperation with the Hawai‘i Department of Education (HDOE) the *Collaborative Residency* has provided an intensive professional development model for classroom teachers. Since its initiation in 2009 it has adapted to the needs and results from its participants, remaining a focus on the collaborative teaching between a teacher and an artist over the time of 10 lessons in the classroom. A scaffolding for this teaching project is provided by a professional development course in the summer and a reflection session in the winter, which provide participants with a theoretical input.
about arts integration, planning time, advice about to institutional standards and reflection on the program. Additionally, every team is observed by the program’s director, who provides feedback.

The cohort for this study participated in the summer of 2014. Classroom teachers and their teaching artist partners engaged in 12 hours of instruction to develop common understandings about intersections between science and the arts for curricular integration, practiced co-teaching structures, and devised essential questions and enduring understandings to guide their lesson planning. They subsequently engaged in 24 hours of additional professional development during the ARTS FIRST Institute 2014: Igniting Curiosity and Creativity, Connecting Science and Arts to learn specific methodologies in arts integration. These two experiences provided teachers and artists a forum to jumpstart their collaborations. The collaborations consisted of 10 sessions of planning time and 10 lessons in the classroom during the first half of the 2014-2015 school year. Subsequently, teachers and teaching artists engaged in a six-hour reflective session to draw the project to closure. The minimum expectation for active engagement in this professional development was 50 hours.

The teaching artists represented the art forms of visual arts, dance and creative writing. All of them had collaborated with classroom teachers in the scope of Collaborative Residency during a previous school year. All teaching artists have been vetted and approved as experts in their artistic disciplines, with demonstrated skill in classroom instruction, a thorough base of knowledge in arts education, and a commitment to their own ongoing professional development.

The Collaborative Residency program provided participating teachers and artists with a common definition of what is meant by arts integration: “Arts integration is an approach in teaching in which students construct and demonstrate understanding through an art form. Students engage in a creative process which connects an art form and another subject area and
meet evolving objectives in both” (Silverstein & Layne, 2010). In this collaboration the participants acted out their expertise as either an artist or an educator in science. Together they were required to build arts integrated curriculum constructed using cross-cutting principles as described in the Next Generation Science Standards (Achieve, 2013). Cross-cutting concepts from the sciences, such as patterns, stability and change, or cause and effect, can be found across school subjects and can help students to make and elaborate meaning in multiple learning contexts.

Additionally during Fall, 2014, classroom teachers developed and submitted a Professional Development and Educational Research Institute (PDERI) portfolio with formal reflections, lesson plans, and analysis of student work. These portfolios allowed teachers to demonstrate their successful participation in the professional development and receive credit toward increased salary. Teaching artists were responsible for developing and submitting a digital narrative (called a diginar) that included photos and videos to visually document the goals and outcomes of their residencies. In December, 2014, the teaching partners reconvened for an additional six hours of reflection and sharing with their peers.

**Purpose and Relevance for Hawai‘i**

There is a dearth of research addressing teachers’ perspectives about the impact of collaborating with professional artists, and this study aims to close this gap. Moreover, Orek (2004) found that teachers with a higher degree of self-efficacy in teaching were more willing to try new ways of teaching. He also found that teachers rarely used the arts in teaching and called for more professional development in this area. With the current study, I intend to add to the body of literature concerning teacher development in arts integration.
With this study, I endeavored to construct an understanding of how collaborative partnerships empower teachers to use art-based strategies within their science curriculum. Furthermore, I intended to reveal teachers’ perspectives on resultant student learning. In order to understand this, I employed Banduras’ social cognitive theory as a framework.

I hoped to give voice to teachers’ experiences about integrating the arts into their science curricula and the supports needed and challenges faced in doing so. In sharing the stories and perspectives of teachers and their students, I hoped to inform future arts integration professional development policies and structures. This study is in line with the ARTS FIRST FY2013-2018 Strategic Action Plan, as it provides information about public policy and educational practice in Hawai‘i. Further, it informs educators about the process of integrating the arts in the science curriculum. It will help stakeholders, lawmakers and citizens to make crucial decisions about arts education in the State of Hawai‘i, and perhaps beyond.
CHAPTER II Review of the Literature

Theoretical Framework

In the field of education it seems that change is constant and urgent. Teachers participate in ongoing professional development in order to improve their students’ learning and their own teaching. Richardson and Placier (2002) claimed that change in teaching is assumed to improve teachers and teaching, which supposedly correlates with better education for students with higher academic achievement. In order to reflect on this assumption of change I employed Bandura’s view on development from his social cognitive theory.

The idea behind social cognitive theory is that learning takes place through social interaction. According to Bandura, it is important to offer situations in which people can “acquire new competencies and gain mastery experience” (Evans, 1989, p. 9). A person might observe others’ behaviors or learn through a modeling action. This social interaction will influence the person’s ability to perform a task and also his or her social behaviors. In Bandura’s perspective, the social dimension cannot be separated from a cognitive process; they are interdependent. The process of learning is highly influenced by our surroundings and our interactions correspondingly. This theory is a model for cognitive interaction of human functioning where thought, behavior and the environment “operate as interacting determinants” (Evans, 1989, p.10). What people think, believe and feel affects how they behave, and also their environments. The outcomes of their actions and the influences of their environments in turn affect their thoughts and emotional reactions, which again evolve into an adaption of thought, beliefs and feelings. This reciprocal determination of the factors of person, behavior and environment determine development and change.
The Collaborative Residency professional development ostensibly influences all three variables: person, behavior, and environment. Having an artist collaboratively working with the teacher over a period of time and implementing arts integration over a stretch of ten lessons can make an impression on the teacher. The strong modeling character of this working relationship can lead to change in teachers’ behaviors. At the same time this change will have an effect on the teachers’ personal attitudes and beliefs concerning the arts integration. The collaboration can also affect the school day. Changes in the classroom environment or structure of the day might be necessary to accommodate the artist teacher, and may alter the typical or usual learning environment. This adaption of the school day might have a reciprocal effect on the teachers’ beliefs and behaviors. It is the goal of this study to illuminate the significant changes occurring in this learning environment of the Collaborative Residency through the lenses of Banduras’ reciprocal factors of thought, behavior and environment.

The theory also emphasizes the social act of learning through the observations of others’ interactions. The reflective process of observed experiences influences the observer and often leads to an adaption of behavior. Bandura (1995) characterized this as vicarious learning. In the case of the Collaborative Residency program, the teaching artist was a model for integrating art strategies in the classroom setting. Not only did the teacher observe the teaching artist but also, due to the collaborative work relationship, the teacher integrated arts strategies with the support of the professional artist. In addition, the teaching artist observed the teacher facilitate learning strategies, and ideally both supported and learned from each other. The framework of the professional development required reflection on the collaborative experience throughout.

As part of social cognitive theory, Bandura emphasized that self-efficacy has an important impact on individuals’ development, directly effecting their behavior and cognition
Self-efficacy describes the belief of “I can do that!” This belief is developed through positive learning situations, and is based on past performances, vicarious experiences, verbal persuasion and psychological cues. People with a high sense of self-efficacy tend to approach more difficult tasks, develop an intrinsic interest and become deeply engaged in activities. They attribute failure to insufficient effort and take on tasks with confidence (Bandura, 1995). Studies by Powell-Moman and Brown-Schild (2011) and Orek (2004) contended that a higher degree of self-efficacy increased teachers’ positive attitudes as they incorporated new teaching strategies.

**Defining the Inter-Disciplinary Relationships**

**Arts in school.** Throughout the history of education, the arts have gained and lost popularity. The arts were seen as an important contribution to education by Dewey (1910), and lost their importance with the rise of awareness for sciences in the 1950s (Gullat, 2008). In times of efficiency and standardized testing, the legitimacy of the arts is tied to their ability to benefit the core subjects and contribute to higher academic achievement (Gullat, 2008). Mishook and Konhaber (2006) looked at various school approaches to arts integration and they discovered that the more important test scores were for a school, the more subservient arts integration became to core subjects. The focus was placed foremost on core content and less on the arts, therefore diminishing an equitable integration. Although some feel that arts integration places the arts at further risk for being marginalized (Eisner, 1999), others believe that integration helps transmit both art concepts and powerful understandings of disciplinary content areas (Stokes, 2004). Regardless, arts integration is not meant to be a replacement for rich instruction focused on the arts itself, and teaching artists are not meant to replace arts specialists in schools.
Eisner (1999) and Winner and Hetland (2001) were advocates of the arts as discreet subjects, questioning efforts to prove that the arts benefit other academic subjects. Eisner (1999) suggested that it might not be specific skills that are developed in the arts but perhaps the promotion of certain attitudes that favor and promote risk taking and hard work, that are beneficial to students. Winner and Hetland (2007) found evidence that visual arts learning outcomes go beyond those defined learning outcomes provided by the US Department of Education. They identified studio habits of mind that are developed while students are engaged in their artwork. These included students’ demonstrations of persistence and perseverance through frustrations. They elucidated students’ expressions that were rich in emotions as they demonstrated a personal voice and vision in their work. With this perspective in mind, it is possible that the motivational effects of the arts cause students to enjoy school more as they experience the social and emotional effects of arts education. In addition to promoting the arts as a discreet subject, studies about arts education often explore integration of the arts in other subject matter in order to emphasize learning in and through the arts (Catterall, 2009; Deasy, 2002; LaJevic, 2006). The concept of arts integration is widely applied but not often defined clearly.

**Arts Integration.** Rabkin and Redmond (2006) defined arts integration as the connection of a subject matter to an arts project, often demonstrated when artists and teachers work together. Artists and teachers paired arts-related activities with academic subjects where similar cognitive processes were evolving. Rabkin and Redmond described these processes as including attentive observation, identification of meaningful detail, selection of appropriate representational strategies, student reflection and self-critique. With a meaningful integration of the arts into the curriculum, students created products that connected with their own experiences
and feelings. This connection with their emotions was what made the work “cognitively powerful” (Rabkin & Redmond, 2006, p.63).

LaJevic (2006) described arts integration as a form of best practice to help teach academic content in an innovative and exiting way. Her qualitative study about the use of the arts in elementary schools revealed that teachers were using the arts more as frills, as exemplified by one teacher who described the arts as “the icing on the cake” (LaJevic, 2006, p. 9). LaJevic strongly opposed this concept, stressing how the arts should not be used to fill in time or simply to color in the worksheet, but should be carefully integrated to help students engage in experimental learning. In her study, she discovered how some curriculum assumes teachers’ abilities to integrate the arts into social studies projects. She found situations in which arts integration lacked integrity and devaluated the arts, and recommended paying closer attention to teacher education and in-service training around arts integration.

The Arts and Sciences. Recently, STEAM initiatives offer a framework for teaching across the disciplines (Wynn & Harris, 2012). By fostering the creative and innovative aspects of science, teachers can support student learning. Root-Bernstein & Root-Bernstein (2013) identified important scientists for whom the arts played an integral role in life; As for example Albert Einstein attributed his discoveries for the theory of relativity to his musical perception from playing the violin and the piano and Nobel price winner Euler-Chelpin became interested in Chemistry by his experiments in color theories while enrolled for the fine arts in college. The authors advocated for art education alongside science education; these disciplines are ideally integrated to support innovative thinking. Skills being developed in the arts, such as observation, visual thinking, the ability to recognize and form patterns, and manipulative abilities are valuable in the sciences. Practice, perseverance and problem solving are essential in both disciplines.
In the workshop sessions for the *Collaborative Residency* program, facilitators presented a theoretical framework for common processes in the arts and sciences. Observation in the arts is like data collection in the sciences; it requires students to develop skills in noticing. Wondering about an object or process in the arts might transpire through acts of imagination, whereas scientists call this curiosity. Rehearsal in the arts is similar to experimentation in the sciences, both requiring an exploration of the unknown. The composition of a piece of art is similar to the design of a scientific study, and in both disciplines this requires visualization. Conclusions are made through analysis and synthesis of information, materials and outcomes of experiments. In the arts, conclusions are communicated to others via performance.

*Critical Links* (Deasy, 2002) is a compendium of studies concerning learning in the arts and its impact on students’ academic achievements and social development. This collection of research revealed positive influences of the arts in student writing, reading, verbal skills, spatial temporal reasoning, cognitive skills and development. It reflected the wide interest in general contributions of the arts academically, but revealed deficiencies when connecting the arts with sciences. However, a meta-analysis of various studies revealed that only a few of these studies withstand the high standards of rigorous research (Winner & Hetland, 2001). This coincides with other research literature, which dominantly describes projects integrating the arts in science (Wynn & Harris 2012; Root-Bernstein & Root Bernstein 2013; Alrutz, 2004) but includes fewer qualitative or quantitative studies about integrated arts and science learning. This may be due to the relatively new concept of STEAM (Gershorn & Ben-Horin, 2014) and varied understandings about the scope of arts integration. Brandon et al. (2007) described a problem evaluating arts integration in schools due to poorly described definitions of art integration, rendering it difficult for researchers to generalize results or refer to previous studies. Research needs to build its
findings on a common ground of the understanding of what arts integration involves in instructional practice.

**Engagement Through the Arts**

Educational literature draws the concept of engagement from research areas of motivation, classroom climate, students’ attitudes, and self-regulated learning (Fredricks & Eccles, 2006). Definitions of engagement are often general and overlap. One approach for a better understanding and conceptualization of engagement is the differentiation of behavioral, emotional and cognitive engagement (Fredricks, Blumenfeld & Paris, 2004; Fredricks, 2011; Wang & Eccles 2013). Behavioral engagement is related to attendance and active participation in classroom learning and school related activities. Emotional engagement is demonstrated by positive and negative reactions to school, teachers and activities. Often a feeling of belonging to the school or a connectedness is taken as emotional engagement (Dawes & Larson, 2011). Cognitive engagement focuses on students’ investment in learning - the degree to which the student is willing to put in effort to comprehend challenging material and acquire difficult skills. Also, this type of engagement is seen in self-regulating-strategies that facilitate intentionality and purpose (Fredricks et al., 2004; Wang & Eccles, 2013).

Almost every state in the U.S. requires observations of teaching as an indication of teaching quality, including Hawai‘i. To that end, Danielson (2010) developed a framework for evaluating teachers that includes engagement of students as one criterion that is essential for teacher performance. In the Danielson framework, the depth of assigned activities, the purpose of collaborative groupings, the relevance of instructional materials, pacing, and the structure of the lesson characterize student engagement.

Literature supports the relationship among involvement in the arts and improved
participation, emotional connectedness, and higher academic achievement. Causal relationships between the arts and academic outcomes exist, however empirical studies are mostly correlational (Catterall et al., 2012). Winner and Cooper (2000) analyzed a number of studies that attempted to show causal relationships between learning in the arts and improving skills in reading, writing, calculating and understanding scientific problems. The findings confirmed an association between the arts and academic achievement but did not establish a significant causal link from the arts to academics. Their meta-analysis identified only two studies that actually proved a causal relationship and five studies that demonstrated correlation between the arts and academic achievement. Still, they suggested that studying the arts can lead to greater engagement, and this can influence academic achievement. Although there is a discussion around the degree to which the arts should be held responsible for engaging students in school, or can be held accountable for student engagement (Eisner, 1999), it is widely recognized that students do enjoy the arts. Gazzinga (2008) concluded that interest in the arts leads to a “high state of motivation” – an increase in motivation leads to sustained attention, which improves performance, and improved performances are commonly attributed to higher achievements.

**Professional Development: Change Through Collaboration**

**Indicators of Effective Professional Development.** A constant flow of reform efforts demands frequent change in teachers’ pedagogical and instructional practices (Saunders, 2012). Instructional change, reforms and the implementation of educational programs are mostly conveyed through professional development. Most professional development structures lack long-term sustained commitment, but in order to improve student achievement, staff development is essential (Supovitz & Turner, 2000). If professional development does not change teachers’ practices, it will hardly have an effect on student learning. One-off workshops
and short learning courses are generally not connected to the settings teachers work in and rarely offer opportunities to experience, practice and reflect; they may offer useful input but will often be superficial (Fullan, 2008). According to an evaluation by Darling-Hammond and Richardson (2009), workshop-style training sessions are still dominating the organization of professional development, even though these short workshops do not affect teacher change or student achievement.

Experts in the field offer guidance to produce meaningful professional development (Guskey 1985, 2002; Supovitz & Turner 2000; Thomas, Hassaram & Kinzer 2012). Scholars agree on several recommendations: First, professional development needs to occur over a period of time. Research has demonstrated that teachers master a new method in teaching after 50 hours of professional development (Gulamhussein, 2014). Second, teachers need support during the implementation of a new teaching approach. Gulamhussein (2014) stated that only 10% of teachers implement a new technique without support, whereas with a support, for example in the form of coaching, nearly 95% of the teachers implement new strategies. Third, professional development needs to expose teachers to active participation. Supovitz & Turner (2000) contended that teachers must be engaged in concrete tasks and get immersed in inquiry, questioning and experimenting. Fourth, professional development must include modeling. Experts need to demonstrate the proposed teaching behavior. This is congruent with Bandura’s (1995) social cognitive learning theory, where vicarious learning, observation and modeling are described as essential learning experiences. Fifth, professional development needs to occur within the context of a subject area. Standards for student performances need to be incorporated as well as deeper content skills. Sixth, professional development needs to connect to school and district reforms, as staff development and school developments cannot be separated.
In addition, literature about change in teaching practices implies that teachers need to experience progress in student learning in order to manifest and adapt a change in practice (Orek, 2004; Guskey, 1985); focus should be on student learning and not on teachers’ behaviors (Supovitz & Turner, 2000). Likewise, Thomas at al. (2012) argued that professional development needed to provide an observable and measurable impact on student learning. Guskey (1985) projected the possibility for changing teachers’ beliefs immediately after receiving evidence of change in student learning outcomes. A change in the teacher’s practice is therefore contingent on students’ development (Guskey, 2014). Educators enjoy teaching more and feel empowered if they are able to influence student learning.

Professional development should also acknowledge the personal beliefs of teachers. These beliefs guide teachers’ content preparation and have a powerful influence on teaching practice and classroom culture; successful and sustainable professional development needs to address a change in teacher beliefs in order to have an impact on teacher practice (Guskey, 1985). According to Goodson (2001), change begins with the transformation of peoples’ perceptions. Therefore a change can rarely be achieved through mandatory reform driven by institutions, but needs to address how people change internally and how this then effects the institution. According to this perspective, schools’ teachers are central to implement change and the institution needs to pay attention to teachers’ beliefs. This is in contrast to a systemic approach where changes are demanded from the institution and the teachers are required to adapt and implement a new program (Goodson, 2001).

addressed teachers’ use of the arts, both concluded that self-efficacy for the newly learned technique is essential for the development of its use. Neither study found a positive correlation between teachers’ experiences in their teaching career and a higher degree of employment of new strategies, making the experience in teaching not significant for the outcome of change.

Finally, learning requires personal investment and willingness to take risks. DuFour, DuFour, and Eaker (2004), stated that teachers’ active engagement in a program is critical for its success. Such active engagement is a hallmark of teaching and learning; both students and teachers are encouraged to make open-ended discoveries and to respond to the content from their own personal experiences. This personalization pays off in a variety of ways. In one study, teachers learning to teach through the arts experienced renewed enjoyment in teaching as they connected to their own creativity (Orek, 2004).

**Collaboration as professional development.** Darling-Hammond & Friedlaender (2008) identified the importance of collaboration for successful school development, and research shows that collaboration has a supportive effect on professional development (Powell-Moman & Brown-Schild, 2011). Universities, arts institutions and other professional institutions have engaged teachers in partnerships to guide professional development or to support school life (Rice, 2002; Thomas, Hassaram, Rieth, 2002). In addition, research supports collaborations at the school level. For example, general and special education teachers sometimes co-teach, learning from each other while supporting their students in inclusive settings (Pancsofar & Petroff 2013; Rytivaara & Kershner 2012; Solis, Vaughn & Swanson, 2012).

Research in science education also describes collaborations between teachers and science professionals. Siegel, Mlynarczyk-Evans, and Brenner (2005) presented a study in which the collaboration with a scientist in the classroom had many benefits for the students and teachers.
Each participant in the partnership brought in their expertise and the students had authentic opportunities to pursue inquiry with a scientist, enacting experimental design and data collection methodologies. Powell-Moman and Brown- Schild (2011) measured teacher self-efficacy over the course of a two-year professional development involving collaboration between teachers and scientists. They found a positive influence on the teachers’ self-efficacy because of these partnerships. Teachers increased their confidence in employing inquiry-teaching techniques and gained a greater focus on depth of content teaching rather than covering all objectives in the curriculum.

Teaching communities offer another model of collaboration (Vescio, Ross & Adams 2008) where teachers collaboratively engage in solving educational problems, though they do not necessarily teach together in the classroom. Vescio et al. (2007) concluded that communities promote change, defined as a fundamental shift in the habits of mind that teachers bring to their daily work in the classroom. In the context of this study, the collaborative relationship between teachers and teaching artists functions as a learning community.

Silverstein (2012) mentioned collaboration as a possible professional development for teachers within teaching artist residencies. Referring to the teaching artist and the increasing level of professional development offered by artist, she presented a checklist for successful residencies, but did not address teachers’ learning experiences. Several studies about teaching artists described students’ experiences (Eckhoff, 2012) or effects on the teaching artist’s work (Franklin, 2005), but neither study addressed what teachers could gain from their collaborations with an artist.
Research Question

As a result of this study, I will explain how the collaboration with an artist influences science teachers’ competence and confidence to use art-based strategies in the classroom. Bandura’s social cognitive learning theory provides a framework to analyze the teachers’ professional development. The influencing and changing aspects of teachers’ personal perspectives, their adapted behavior, the interaction with others, and adjustments the teaching environment revealed an interdependence of these facets. Therefore, this research explores the three reciprocal factors of teachers’ personal beliefs, behaviors and their environmental influences (Bandura, 1995) and related this to teachers’ experiences of arts integration in science classes. I will reflect on these areas contributing to teachers’ change through the following questions:

Personal perspective: (a) What are teachers’ perceptions of integrating the arts? (b) What are teachers’ levels of confidence in teaching through the arts? (c) How do teachers perceive student engagement?

Behavioral Perspective: (a) How frequently do teachers employ arts strategies? (b) How do interactions with students change? (c) How well do teachers implement arts strategies?

Environmental perspective: (a) Is there a change in the organization of the school day or of the classroom? (b) How does the classroom curriculum fit with integration of the arts?
CHAPTER III Method

Research Design

This bounded multiple case study research strategy employs thick description and narrative analysis to elucidate teachers’ ongoing arts integration in day-to-day classroom practice after their experiences in the Collaborative Residency program. The increased use of narrative inquiry in educational research helps to make meaning of teachers’ experiences (Sanders, 2013). By exploring personal stories and framing them in the collective, researchers are able to reflect on these personal stories, identify what teachers find meaningful, share and compare the stories, and potentially generalize that meaning to a larger group or make recommendations for changes in practice or policy. The goal in educational qualitative studies is to identify and address educational needs in order to make recommendations (Yin, 2003).

Participants and Setting

Participants of this study include three elementary school teachers from two different schools on the island of Hawai‘i who participated in the Collaborative Residency program in summer and fall of 2014. They were part of a larger cohort of 15 DOE teachers, grades K-6 and eight advanced teaching artists from the State Foundation on Culture and the Arts (HSFCA) Artistic Teaching Partner (ATP), who committed to be part in the Collaborative Residency program in spring, 2014.

As Stake (2005) suggested, the case selection was complete before the study began. I selected a total of three classroom teachers out of the pool of 15 possible teachers to participate in this qualitative multiple case study (Table 1). One teacher declined for personal reasons and was replaced. In the larger project there had been another two teachers who rejected to take part. Participants were purposefully selected to include both classroom teachers who had prior
experience collaborating with a teaching artist in the Collaborative Residency program and those new to this program. One teacher collaborated with the same artist in the previous year and one teacher was embarking upon the Collaborative Residency for the fourth time. Attention was paid to ensure that teacher grade levels were balanced among upper and lower elementary grades, art forms were varied, and teachers had a degree of comfort and experience integrating the arts. This led to a combination of first, fourth and sixth grade classrooms and included the art forms of visual art and dance, while dance was represented with two collaborating teams with the same artist.

All three teachers were female; two of them of Caucasian ethnicity, and one part-Hawai‘ian. Their ages range from 35 to 55 years with having teaching experience of six to eight years. See Table 1 for demographic information about the teacher participants.

Participating teachers each selected four of their students to participate in a focus group, for a total of 12 student participants in three focus groups. There was an equal distribution of gender and ethnicity among student participants. I retrieved demographic information about the schools from official DOE reports publically available on the Internet.

*Table 1. Participant Demographics (all names are pseudonyms)*

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Ethnicity</th>
<th>Grade</th>
<th>School</th>
<th>Art Form</th>
<th>Prior Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abby</td>
<td>Mixed/Part-Hawai‘ian</td>
<td>4</td>
<td>DOE</td>
<td>Visual Arts</td>
<td>3 years</td>
</tr>
<tr>
<td>Kaila</td>
<td>Caucasian</td>
<td>1</td>
<td>Charter</td>
<td>Dance</td>
<td>1 year</td>
</tr>
<tr>
<td>Monica</td>
<td>Caucasian</td>
<td>6</td>
<td>Charter</td>
<td>Dance</td>
<td>none</td>
</tr>
</tbody>
</table>
**Researcher Role**

This research is part of a larger project done for the Honolulu Theatre for Youth. The theatre’s director of Drama Education was one of the main facilitators of the professional development *Collaborative Residency*. His interest in research on the program supported this study and provided funding for travel to the other islands. As one of the stakeholders he is interested in research results from studying the program, which he might use for grant applications. However he did not create any limitations on how the research was to be designed or conducted. I developed the research question. I worked with one collaborating faculty member to develop the methodology and we shared the responsibility for data collection for the larger report, which was necessary considering time, funding and the scope of a representable number of participants. We worked on one case collaboratively to identify initial themes and align our data collection process. Following I collected the data and analyzed it independently for the three cases in this study. The larger report included the initial case and two further cases whose data were collected and analyzed by my collaborator. After I completed the cross-case analysis with the three cases, we then did a cross-case analysis of all six cases for the larger report. We met often to evaluate the procedure. My collaborator crosschecked my coding and confirmed the themes developed for the three cases presented in this study. This process supports the trustworthiness and reliability of my findings.

I have a background in teaching for eight years at the elementary and high school level, and have collaborated with various artists throughout my teaching career. These experiences shaped my teaching and increased my confidence to incorporate multiple arts projects in my teaching. Through these experiences, I noticed a memorable impact on students’ self-efficacy, communication, persistence, creative problem solving and abilities to do collaborative projects.
This work had an impact on my identity as a teacher and my self-efficacy as a teacher and in integrating different forms of teaching. The rich experience in working with professional artists has made me an advocate for this type of collaboration in the classroom.

**Instruments and Data Sources**

This research includes the following sources of data: video recordings, audio recordings, field notes, reflection forms, interview transcriptions, copies of portfolios, digital narratives (diginars) and artifacts of student work. Table 2 summarizes the timeline, instruments, and types of data collected. All focus groups and interviews lasted approximately 45 minutes; the digital narratives are 5 minutes each, and written reports varied in their length and detail. See the appendices for the interview questions and observation protocol.

**Table 2: Summary of data collection**

<table>
<thead>
<tr>
<th>Time</th>
<th>Instrument</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data collection at the termination of the CR</td>
<td>Teacher Focus Group</td>
<td>Audio recording of discussion among teachers’ and their perceptions of the Collaborative Residency (CR)</td>
</tr>
<tr>
<td></td>
<td>Interview with CR personnel</td>
<td>Audio recorded narrative of the observed collaborative teaching teams to reconcile programs quality</td>
</tr>
<tr>
<td></td>
<td>Portfolio and Digital Narratives</td>
<td>Teachers’ reflections on individual student learning and development in written portfolios. The artist created Digital Narratives as visual documentation in form of Slideshow demonstrating students’ process and products during the CR</td>
</tr>
<tr>
<td></td>
<td>Field Notes</td>
<td>Ethnographic field notes from program’s final reflection day collected by the researcher of this thesis</td>
</tr>
<tr>
<td></td>
<td>Art-First-Institute Reflection Notes</td>
<td>Artifacts in form of reflection notes from teachers</td>
</tr>
</tbody>
</table>
Post collaboration data collection | Teacher Interview | Audio recorded narratives of each teachers’ personal, behavioral and environmental perspectives of her arts integration
---|---|---
Sample Student Work | Artifacts provided by students and teachers demonstrating integrated understanding
Student Focus Groups | Audio recorded narratives of students’ perspectives of the science classes
Classroom Observation | Video recording and ethnographic field notes documenting how teachers employed art strategies and interacted with students generated by the researcher of this thesis

**Procedure**

During the *Art First Institute* in the summer, 2014, I established my first contacts with participants. The *Collaborative Residency* program supplied details about the participants’ teaching experiences, recurring participation, and the art form integrated to begin the process of purposefully selecting participants.

Upon Institutional Review Board (IRB) approval from the University of Hawai‘i and the Department of Education (DOE) in November, I contacted potential participants on the island of Hawai‘i. One teacher denied to participate and a substitute was found to guarantee the representation of different art form, school, grade level and experience. All participants provided informed consent and assent according to DOE and IRB guidelines. The activities for this study began upon the conclusion of the professional development program and data collection started at the portfolio sharing session in December, 2014. In March I visited three classrooms on the island of Hawai‘i; I observed each participant’s classroom for one lesson, conducted one interview with the teacher, and facilitated a student focus group. The teachers agreed to demonstrate an integrated science and arts lesson including strategies they learned with their
teaching artist partners, although they individually decided on the specific topic and lesson they prepared for observation.

At all sites, I videotaped the integrated lesson, and audiotaped teacher and student interviews. All data collection was conducted in either the teacher’s classroom or in a nearby classroom at the school. I used the Dedoose software for coding and cross-examining the data. In order to make sure all research questions were addressed with the data collected, I developed a matrix between the research questions and the data sets (see Table 3). Research questions were organized around Bandura’s triadic reciprocation model in order to integrate the theoretical perspective.

Table 3: Overview of data collection instruments and research questions

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Seminar Field notes</th>
<th>Portfolio</th>
<th>Focus Group interview</th>
<th>Interview with AFI facilitator</th>
<th>Observation</th>
<th>Teacher Interview</th>
<th>Students Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Perspective</td>
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<tr>
<td>Perception of the integration</td>
<td>√</td>
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<td>√</td>
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<tr>
<td>Confidence in teaching the arts</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
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<tr>
<td>Perception of student engagement</td>
<td>√</td>
<td>√</td>
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<td></td>
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<tr>
<td>Behavioral Perspective</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Employing arts strategies</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td>√</td>
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<tr>
<td>Interaction with students</td>
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<tr>
<td>Implementing the arts</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Environmental Perspective</td>
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<tr>
<td>Organization of the school day</td>
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<td></td>
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<tr>
<td>Organization of the room</td>
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<td>√</td>
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<td></td>
</tr>
<tr>
<td>Curriculum fit</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td>√</td>
</tr>
</tbody>
</table>
Data Analysis

Also in December, 2014, an interview with the main facilitator, the Honolulu Theater for Youth’s director of Drama Education was conducted to ascertain his impressions of the overall quality of instruction he observed on his visits to the respective collaborative teams. These data are not included in the findings, however his report suggests faithfulness of implementation; in other words, the collaborative partners applied strategies and processes as the program intended during the CR.

Yin (2003) referred to the importance of diverse sources of evidence in order to address problems of construct validity and reliability. Therefore, I triangulated data through a variety of instruments including observations, interviews and artifacts. By comparing different sources of data I was able to identify evolving patterns (McMillan & Schumacher, 2010), and convergences of the data.

Each case was analyzed separately in order to present its particularities. The narrative analysis followed the steps of examining, categorizing, tabulating, creating data displays, testing, and combining the evidence to address the initial research questions (Stake, 2000). A first step in this content analysis was open coding. In the context of the larger project, I coded and reached agreement on emerging themes on a case conducted on O‘ahu conjointly with my collaborator in order to promote interreliability. Following an analytical strategy as proposed by Yin (2003), I compared the themes with the proposition of the theoretical framework and refined them.

Bandura’s theory of reciprocal determination provides a structure to reflect on teachers’ experiences and changes in the three different areas, the teachers’ personal beliefs considering arts integration, their adaptions of behaviors as a result of integrating the arts and a change in the environment due to the integration of the arts. The reciprocity implies that a change in one area is
interdependent and influential on the other areas and makes it important to recognize changes in all three areas and discover their influence upon each other. I developed four categories from the data as an initial outline to organize the findings: (a) student learning, (b) teacher change, (c) influencing factors, and (d) teacher’s perception of arts integration.

Although these four themes functioned as a framework to code the subsequent three cases, I provided the option of adding codes or categories as suggested by the data themselves. After this initial coding, a third step involved corroborating the data through cross coding with my collaborator. We discovered that “teacher’s perception of arts integration” overlapped substantially with the other three themes and therefore dropped this as a classification and integrated findings accordingly into the remaining categories.

Stakes (2005) referred to the analytical work in a case study to be observational and reflective. The researcher explores meanings by relating each case to the context as a whole and the experiences that were made by each individual case. Every case tells a different story and it is through the cross-case analysis that I identified patterns across the three different cases. These patterns included matching likenesses and contrasting rival interpretations. The findings were summarized in the cross-case analysis according to teachers’ beliefs, teachers’ behaviors and teachers’ environments. This organization was a structure suggested by Bandura’s reciprocal model to organize and visualize the data. As a final step I addressed the research questions specifically and discussed the findings considering the relevant research literature.

Trustworthiness

As a qualitative study, this research strived to rigorously describe teachers’ personal perspectives on arts integration, their aptness in employing arts strategies, and their arrangements of classrooms and curricula to allow arts integration. All transcripts were shared between the
collaborators via Dedoose. They were not shared with the participating teachers and students. But, to establish trustworthiness of the data, teacher participants received their written individual case description via email. The teachers had the opportunity to make corrections, clarify meanings, and check veracity of their case descriptions.

There are a few limitations to this study. First, all participants came from the Collaborative Residency project, and are not necessarily representative of the general population of teachers working at DOE schools in the State of Hawai‘i. Another bias is reflected in the teachers’ voluntarily participation. Before teachers agreed to participate, they were informed about the timeframe of the study, which indicated that data collection would take place after the collaborative work with the teaching artist had ended. Therefore, the participants likely believed in the positive effect this collaboration would have on their teaching; they probably also had a certain self-efficacy regarding their competence of integrating arts strategies in their curriculum.

As an advocate for arts integration from my previous teaching experiences, I was aware of my bias, and made efforts to partition my preconceived notions out of my analysis as much as possible. As a researcher, I was exploratory and broad in scope. In order to strive for objectivity, I kept a journal and took memos; evaluating these allowed me to check my approach with an open mind. Reflecting on and separating these reflections from the participants wording supported me to avoid bias. I was interested in finding answers about what makes the collaboration with the artist fruitful and empowering, but also did not neglect a critical view. My findings were cross-checked by my collaborative partner, adding to the reliability of these results and limiting potential bias.
CHAPTER IV Results

Case Descriptions

In this section I present three individual cases that are organized according to the three themes: (a) student learning, (b) teacher change, and (c) influencing factors. The theme of student learning has the subthemes engagement, collaboration, enjoyment, critical thinking, conceptual representation, and persistence. The dominant characteristics of this theme demonstrate how teachers perceived value in their students’ learning experiences, revealing teachers’ personal attitudes about how students learn and the behaviors that support learning. The theme of teacher change includes the subthemes teachers’ confidence, planning, assessment, and pedagogical approaches to teaching the art form integrated in science curriculum. It reveals the development in the teachers’ behaviors with respect to arts integration. The third theme of influencing factors demonstrates how the co-teaching relationship with the teaching artist, and institutional factors (such as school structures, room arrangement, schedule, the administration) all played a role in the teachers’ development.

Abby. Abby (pseudonym) has been a fourth grade teacher for the past eight years at a K-8, traditional public school. About half of the 800 students at this school receive free or reduced cost lunch, 9% receive special education services and 15% have limited English proficiency. The ethnic composition of the school includes 28% White, 21% Native Hawaiian, 15% Filipino and 15% Micronesian, and a remaining mix of multiracial ethnicity. The school is focused on teacher professional development using Guided Language Acquisition Design (GLAD), a program that supports content with visual scaffolds. The school is slightly above the average ranking in the Hawai‘i State Assessment, indicating steady student improvement and achievement as determined by Reading and Math scores. There were three other 4th grade classes in Abby’s
grade level, and the classroom teachers collaborated, shared their experiences and supported each other in their ordinary grade level activities (Abby Interview, 2015, March 24).

Abby collaborated with Helen, a visual artist, for the fourth consecutive year of Collaborative Residency project. Helen (pseudonym) is an experienced certified DOE arts teacher, who has been a teaching artist on the Artistic Teaching Partners (ATP) Roster since 1989. Helen’s focus is to engage the classroom in curiosity and discovery and help teachers learn strategies they can use to teach art throughout their curriculum. Abby said that she enjoyed the work with Helen, believed they worked well together as a team, and valued the support she received to incorporate arts standards in her classroom. Abby expressed a high value for arts in education in general, wishing for a stronger presence for art in DOE schools. She stated:

But if they [DOE] saw the results that we get [from] these kids and the engagement and how it makes learning that much more internally at a deeper level [then] I think they would … push more for arts to come back as a regular part of the curriculum. (Abby Interview, 2015, March 24)

During her residency with Helen, Abby’s unit investigated differences and similarities between plant and animal cells. Her goal was to have students look at the scientific process from an artistic point of view. During the data collection in spring which took place after the collaboration had ended, I observed a lesson that was an introduction to an arts integrated science project; students used informational text to research food chains of different ecosystems. The final product would be a diagram reflecting the interaction between consumer, producer, and abiotic factors. The essential question that Abby developed during the collaboration in the fall was still alive throughout the curriculum in the spring: How does questioning help observation?
**Student learning.** Abby primarily saw the benefit of her participation in the Collaborative Residency for her students. The collaboration with an artist guaranteed her that students were exposed to qualitative arts instruction.

**Observation.** Abby’s drawing instruction focused on precise observation; students learned drawing by recognizing basic shapes within a subject. She saw how “the kids actually reflected that they take the time now to slow down and notice things more” (Abby Teacher Focus Group, 2014, December 6). Abby explained:

The kids are … able to start with a basic shape. Instead of focusing on the big thing, they focus on the smaller things about their objects. They take the time to break it down, if needed, if it’s a difficult picture. (Abby Interview, 2015, March 24)

One student recalled how precise observation helped him test his perception of reality. He learned to be persistent with his drawing, reevaluating it over and over again. He stated:

The drawing helps us, but it lets you see how you can do it, and then see -- look at what it really looks like and see how good you are at it. And then … maybe it might teach you that you can do better on it (Student Focus Group, 2015, March 24).

**Reflection.** Students reflected throughout the lesson to gain a deeper understanding about what they were thinking and doing. Abby wanted to ask the “right” questions; to encourage students to reflect, observe, think critically, and gain a metacognitive awareness of their process. Abby stated: “When they (students) ask, ‘How can I make this?’ they say, ‘What’s wrong?’ And it hits me like, ‘it’s not what’s wrong,’ it’s, ‘What can you do to make it better?’” (Abby
Interview, 2015, March 24). Reflection was an integral part in the residencies, and Abby used personal reflections with students to help them develop their work. She mentioned:

Some of them are like, “Oh, this is ugly. I don’t like this,” … and you reflect on,

“Well, this is just a beginning. You’re learning new skills and this is a challenge for you now,” and just reiterating that [they should] keep practicing. (Abby Interview, 2015, March 24)

Engagement. Students expressed their appreciation for their arts experiences; they looked forward to arts lessons and asked for more. They enjoyed drawing and voiced that it helped them learn. One girl stated: “I guess I wish we would do more drawings because that helps you know what it is …” (Abby Student Focus Group, 2015, March 24). Abby noticed higher engagement in arts integrated topics in tandem with critical thinking: “I see definitely a lot more engagement, and it’s different engagement to where they’re able to know that there’s no one right answer” (Abby Interview, 2015, March 24). Engaging experiences stimulated students’ thoughts and awareness, and the teacher noticed deeper meaning in her conversations with the students.

The observed lesson in March demonstrated students’ excitement about working on art projects in a collaborative environment. One girl showed excitement by raising her arms and smiling at the prospect of group work. Students were able to appreciate each other’s work, give detailed feedback to each other, and received feedback as well. Another student commented: “Working with other students can help if you’re thinking of an idea and you forget it, maybe the other person knows that idea. They might say that idea” (Student Focus Group, 2015, March 24).
**Teacher change.** Abby reported that she experienced a change in her teaching behavior. Besides gaining more self efficacy in instructing art techniques, she found that students replied well and she aimed to incorporate art topics more frequently.

**Self-efficacy.** Abby grew in her skills and confidence each time she collaborated with the teaching artist. It had been a personal challenge for her to develop her confidence and continue to integrate once the artist had left the classroom. In this fourth round of the *Collaborative Residency* program she expressed feeling more comfortable and capable of taking over instructions in the arts. This time, she also introduced artistic techniques she learned in previous years of the program. She gained a clearer understanding of techniques and visual art specific vocabulary during this third year of participation. She summarized:

> I now have a bag of tools that I can now use to teach art either by itself in a mini lesson or with other subjects besides science. So I feel more confident now that I can carry on - I went through that fear factor period too, like I can’t do this on my own, what if I screw up then the kids would be like, “That’s not how Miss Helen taught.”

**Pedagogy.** The arts offered students a way to express what they had learned and a way for Abby to formatively assess that learning. Abby stated: “It’s just another way for the kids to show us what they’ve learned, what they understand, and what they still need to maybe further investigate” (Abby Interview, 2015, March 24). She appreciated the way the arts provided a path for students to express their ideas.

Abby found a relationship between integrating more visual examples in her lessons and students’ ownership of their learning. The class created “Elements of Arts” notebooks, which included reference information about drawing techniques and arts elements. Students referred to
the booklet while immersed in their artwork. Some students presented it to one another, and others used it to improve their drawings. Abby said:

I try to definitely incorporate more visuals with the kids and a variety of visuals. So it’s really made me think more of how I can… make the lessons adaptable to them and their needs. And then that will lead into better instructions and also the kids, if I give them good instructions and they learn after I’ve broken down the lesson for them, they’ll feel comfortable enough to teach other. Which is them taking the ownership. (Abby Interview, 2015, March 24)

*Frequency of arts integration.* Visual arts do not regularly appear on the class schedule but Abby continues to either integrate the arts or develop art projects with her students: “I’m trying to at least do once a month or if not biweekly where the kids have just a set time, no other interruptions, just sit down and do their art.” However, she mentioned that art is the first thing to be dropped when time is an issue and referred to constraints of the mandatory curriculum. There is a conflict between Abby’s desired frequency of arts integration and the limitations of her time. She said:

I wish everybody could do it because it’s a great experience because we don’t get arts enough into the schools on a regular basis. And it’s always hard. And to just know how to integrate arts with other subjects is something I’ve learned too. It doesn’t always have to be a separate thing. It can always be integrated. And the kids, they’ll get a huge benefit out of it. (Abby interview, 2015, March 24)
**Influencing factors.** The collaboration with the artist brought a change to Abby’s teaching environment. She built a supportive relationship with the artist who functioned as a model demonstrating techniques and interactions with students which influenced Abby in her teaching, structuring of the classroom, and organization of the school day.

**Relationship with the teaching artist.** Throughout their four years of co-teaching, Abby experienced that she and her partner benefited equally through developing competencies and sharing responsibilities in instructing the students. In the first year, Abby mainly watched and served as an assistant, in this fourth residency she introduced elements of arts before the artist even came to class. She contributed to the artist’s learning as well, as she explained:

> I have helped my partner better understand the scientific method of inquiry as well [as] some fourth-grade science standards for life science. My partner gained a clearer understanding of creating 3D gelatin models for students to practice observational drawing skill techniques (Abby Interview, 2015, March 24).

Abby enjoyed the collaborative planning -- revising ideas and agreeing on reflection questions. During the lessons, instruction was flexible and both partners learned to adapt to spontaneous changes, demonstrating collaborative ownership in both areas of science and art. Abby expressed: “So it’s nice to see that we could bounce ideas off each other or just, like, ‘Oh, I know that’s not going to work,’ so just being able to change on the spot, it’s good” (Abby Interview, 2015, March 24).

**Modeling by the teaching artist.** The experience of co-teaching with a teaching artist boosted Abby’s confidence to integrate the arts on her own and also helped her to build a strong understanding of the arts standards. She observed the artist teach and use questions as feedback to help students improve their pictures and drawings. The artist modeled how to frame questions
without giving the answers but rather supported students to develop a thinking process for arriving at their own solutions. Abby said:

She’s seen what we needed to do and she told us to do that by asking us: “What does it look like, does it look kind of close to the picture that you’re drawing?” (Abby Interview, 2015, March 24)

Space and time. Abby used the space within her classroom to integrate the arts. The students’ tables were arranged in clusters to provide the opportunity for partner and group work. This enabled students to collaborate in their table groups without additional room rearrangement. Abby mentioned the lack of time as the biggest constraint for actually doing the arts – if time was scarce, she would cut out the arts. For example, there was a snowflake-drawing project that still needed to be finished. Abby quoted herself with a familiar phrase: “Oh, sorry, we ran out of time today. We can’t do it” (Abby Interview, 2015, March 24).

Administration, colleagues, parents. According to Abby two colleagues at her grade level integrate the arts every other week or once a month; therefore, Abby did not feel as if she was the only one trying to make time for the arts. Nevertheless she did not mention any collaboration with the other teachers about the content of these arts integrated classes. There were no comments about administrative support or parental support to continue the arts integration. After the teaching artist made her exit, Abby seemed to be replicating the things she learned on her own.

Kaila. Kaila is a first grade teacher at a K-12 charter school that has 330 students. Of these, 30% are White, 29% Pacific Islander, 9% Asian, 8% Multiracial with remaining small percentages of Hispanic, African American and Native American ethnicities. At this public charter school, 57% of students are considered to be proficient in math and/or reading, in reading
72% of students demonstrated abilities at or above proficiency while in math it was significantly lower with about 42% of students. There is one class per grade at the elementary level.

Kaila’s school created a flexible environment for scheduling her integrated science and dance classes. Additionally her school had a designated music and dance room, which Kaila’s class used every Wednesday morning. It was in the school’s agenda to help students explore creative ways for learning and Kaila was proud to be able to support this vision with the support of the Collaborative Residency project.

Last year was Kaila’s first time collaborating with a teaching artist; she responded to a note posted by Naomi (pseudonym), a teaching artist, about looking for a teacher to team up with for the Collaborative Residency project. She did not know anything about it, but was interested in learning something new. Naomi was a professional ballet dancer and had extensive experience integrating movement into the curriculum. She had worked with students and teachers as a teaching artist since 1991. Kaila enjoyed the collaboration enough to enroll during the current program, and also encouraged her colleague Monica to join. Later in the year, she joined an additional professional development for using drama techniques in language arts and experienced successful implementation in both dance and drama.

Naomi co-taught with Kaila in fall, 2014 for ten lessons. They collaboratively planned a unit based on the enduring understanding: cycles move our world. They worked with the students on life cycles of the moon, plants, the cycles of daily life, and dance cycles. The artist focused on how to integrate dance and how to introduce the students to elements and techniques of dance, which supported meaningful connections between cycles of dance and cycles of life. During the March observation, students demonstrated their knowledge of the mealworm by dancing its life cycle.
**Student Learning.** From Kaila’s perspective, student learning was influenced positively by connecting a topic across the subjects. Student reflections provided situations to increase awareness for students about their process of learning. In general students demonstrated high engagement in the movement classes.

**Connecting science and dance.** Integrating the arts provided Kaila’s students with various learning experiences, transferring the knowledge from one experience to another generated understanding. For example, in Kaila’s classroom, students had small glasses with mealworms so they could witness metamorphosis first hand. During observational periods, Kaila referred to movement vocabulary, such as shape and space, to stimulate critical thinking and begin making connections across disciplines. Students connected observational knowledge with kinesthetic experience and emotions. Kaila explained how she might prompt their learning. She told them:

“… I wonder what that shape would look like if you could make that shape.” So I’ll just drop these little hints and get them thinking. And it does definitely help. Like with Neville (pseudonym) mentioning that comment about how… parts of his body were different parts of the beetle. (Kaila Interview, 2015, March 25)

After asking the students what they learned in the mealworm movement lesson, one responded: “It helped us to learn what they’ll turn [into] and what they’ll do when they grow and grow” (Kaila Student Focus Group, 2015, March 25).

**Reflection.** Ongoing reflection during the lesson helped students become aware of their process of learning, and Kaila referred to this as “deeper understanding.” She perceived that students connected to their emotions when they experienced the movement of the mealworm. For example, Kaila described one child’s experience:
We were reflecting on how we use our body to move as a mealworm, and he said, “Oh, I was digging down in the oatmeal and I was hiding under the oatmeal,” because it’s a container of oatmeal. And I said, “You really thought you were in oatmeal, didn’t you?” and he’s like, “Oh, yes.” So, his head is in the head of the mealworm. He’s definitely taking on the role of the insect, twitches… (Kaila Interview, 2015, March 25)

Reflection questions such as “What would you have to do to get out of that exoskeleton?” (Kaila Observation Notes, 2015, March 25) challenged students to verbalize their movement using vocabulary terms specific to dance and science while making personal and emotional connections to the content.

Engagement. Kaila observed how the essential question ignited the spirit of discovery for her first graders. They started to explore cycles across contexts. They became intrigued looking for cycles in their own experiences with time, such as months, days, and meal times. The teacher said: “Well, I think it’s helping them understand and it’s helping them remember and it’s just helping them to be more interested.” (Kaila Interview, 2015 March 25). The observation protocol revealed that students were engaged for about half of the lesson’s time in arts activities, and active in problem solving or decision-making activities for 30% of their lesson. I also observed that, though a majority of students were actively listening and responding to the teacher’s prompt for about 90% of the lesson, about eight students were easily distracted and had trouble staying focused.

Teacher Change. Kaila experienced a change in her confidence regarding teaching science integrated dance lessons. She felt that this form of teaching supported her core beliefs in how teaching should be practiced.
Self-efficacy. Through participating in the Collaborative Residency project, Kaila felt teaching became more interesting for her; she enjoyed lessons in the movement room and felt herself developing a style aligned with her values of engaging and effective teaching. Kaila connected her enjoyment with her growing confidence in integrating the arts: “I feel much better doing it even on my own because I’ve continued. I’m more confident, I’m more comfortable and… it’s like my most enjoyable part of teaching. It’s just the most fun” (Kaila Teacher Focus Group, 2015, March 25).

In most instances, Kaila pointed to the strong impact of the Collaborative Residency program on changes to her teaching. The experience with the teaching artist explicitly demonstrated to Kaila how she might integrate the arts. She now integrates movement vocabulary with a variety of floor patterns in movement lessons. She believed that the theoretical input from the program became practical with Naomi’s help. She had been skeptical about arts integration but the artist’s confidence and knowledge supported Kaila to change her mindset, demonstrating that integrating arts can be done. She stated:

I would ask: “Why is this going to work? What is this?” Naomi’s just very confident. She knows. She’s seen it work, so she knows it’s going to work. And she kind of keeps moving me forward, like, “You’ll see.” … So she’s got that confidence in her mindset, which is good for me to work [with]. (Kaila Interview, 2015, March 25)

On another note, Kaila stated: “I know I have definitely taken a stronger role each lesson. This has always been my greatest challenge because it puts me right outside of my comfort zone…” (Kaila Interview, 2015, March 25). Kaila’s self-efficacy grew through Naomi’s confidence and by taking her own risks.
Pedagogy. During the Collaborative Residency program, the teaching team incorporated an essential question and enduring understanding with ongoing reflection as a mandatory requirement for the unit. As a result, reflection became an integral part of Kaila’s movement lessons; students improved awareness of their actions and verbalized their learning using dance and science vocabulary. Kaila stated: “So the component of the students having to reflect on their learning has been added through the Collaborative Residency” (Kaila Interview, 2015, March 25). In the observed lesson Kaila incorporated two points of reflection when students responded to her prompts. The first was to recall students’ knowledge about the life cycle of the darkling beetle and the second referred to the learning at the end of the lesson. “How did the different shapes help you learn about the life cycle of the beetle?” (Kaila Field Notes, 2015, March 25).

Through coaching, Kaila also improved her ability to provide feedback to students. During their metamorphosis dance, she verbalized students’ body positions and movement by carefully observing their performances. Kaila noticed an improvement in her ability to observe students and stated:

I learned so much from observing Naomi! She helps me observe the students much better than in the past. I am learning what to look for in the movements just by listening to her feedback.

Frequency of art integration. Kaila now integrates the arts on a weekly basis according to a set schedule; she arranged for access to the movement room every Wednesday. One reason Kaila continues to integrate the arts is the fact that she experienced improved student learning and improved student behavior. She was able to compare learning results between her first graders last year and her first grade students this year and noticed an improvement in the students’ dances:
So I saved my mealworm unit to do now in the spring and major difference between the fall group and their learning and this group -- because this group already did movement and cycles, so they’re familiar with the lingo used, the language, the vocabulary. And now their application was that much better. I think their metamorphosis dance was far better than my 2013 group that was just learning it. (Kaila Interview, 2015, March 25)

**Influencing Factors.** Kaila enjoyed the collaborative work and experienced support and positive influence from her environment. She experienced the collaboration with Naomi as supportive and encouraging.

**Relationship with teaching artist.** Kaila attributed the opportunity to collaborate with an experienced teaching artist as one of the most important factors for her professional development. She characterized the relationship with the artist as supportive, nurturing and inspirational. The artist’s expertise guided the lesson planning and assessment, and helped Kaila develop the confidence she needed to integrate dance. During the lesson the artist modeled and scaffolded instructions for movement, which still resonates for Kaila: “Every time I teach movement, [the artist’s] voice is in my head. Like literally, I hear her in my head. So I probably am kind of copying her style almost” (Kaila Interview, 2015, March 25). The artist took the role of a coach as they planned out the classes collaboratively. Their co-teaching strategies switched seamlessly as their responsibilities shifted between the roles of observer, teacher and assistant. Nevertheless Naomi expected Kaila to take over more of the dance instruction. Kaila explained:

And our planning this year, the second year, was very different because she really expected me to take over more and more and more, and by the end I was doing
almost all of the teaching and … she would step in so it was still team teaching, but I kind of had the bulk of it. (Kaila Interview, 2015, March 25)

Professional Development. Kaila voiced her appreciation for the structure of the program and the opportunity to improve her teaching to be “more interesting and more effective” (Kaila Interview, 2015, March 25). She valued the monetary compensation for planning time with the artist as well as the confidence she gained by working with the artist in the classroom over a longer period of time. She also acknowledged that it takes time to adapt to a new teaching style and appreciated the structural support of the program: repeated co-teaching experiences over a good length of time with required reflection through the portfolio.

The most helpful thing is that I have to do it. Because when you’re working in collaboration, you have a responsibility and a commitment. And if I didn’t have that, I probably wouldn’t work as hard…. When you’re forced to do something, especially for 10 weeks in a row, and then write a portfolio about it and then you see how well it works, you’re going to do it. You’re going to… keep doing it during the rest of the year. (Kaila Interview, 2015, March 25)

Space. The amenities of the charter school supported Kaila’s integration practices. The regularly scheduled time in the movement room opened up a new way of teaching that might not have been done as easily in the classroom; it was much simpler to go upstairs to another room than moving tables and chairs around with first graders. Further, the regular classroom space is located within a single room shared by first, second and third grade classes, and movement activity facilitated with a percussion instrument would have disturbed the neighboring classes. It can be daunting to facilitate sound and movement as a novice when other professionals are within earshot.
Flexible curriculum. Kaila’s charter school provided her flexibility in structuring and scheduling the learning content. The charter school followed the Common Core State Standards (CCSS), and Kaila felt that integrating the arts supported her CCSS curriculum. “I think it just makes the standards easier to teach or more interesting to teach. The standards are very -- they’re really kind of dry…” (Teacher Focus Group, 2014, December 6).

Kaila voiced that integrating the arts and science did require more time. This took time away from other subjects like Social Studies. Kaila said: “Art and science do take time especially when you need to reflect and revise before you share or present your performance or your findings“ (Kaila. Interview, 2015, March 25).

Administration, colleagues, parents. Parents, colleagues, and the administration were not very aware of what was happening in Kaila’s movement classes. She tried to keep colleagues informed by sharing the digital narrative she developed with Naomi, but others did not express interest in joining the experience. Kaila chose to inform her administration about her work and impressed her principal with an arts integrated lesson for her Educator Effectiveness System (EES) evaluation. She stated:

But this year he [the principal] decided that he wanted to do EES and he was going to observe and I got a little bit nervous. But I thought, “I’m going to do this. I’m going to do a science and movement class.” So I did a force and motion class and lesson, and he really liked it. He rated me very highly. So that was his first and only exposure this year to what I’ve been doing. He sign[ed] off on some permission slips I think in the beginning of the year with the Collaborative Residency, but we don’t talk about it. With the elementary school teachers, I
always share digital narratives so they can see. But other than that, they don’t know a lot about it. (Kaila Interview, 2015, March 25)

**Monica.** Monica has eight years of teaching experience at the same charter school as Kaila. She is currently teaching sixth grade and has been teaching this class of students since they were in the fourth grade. Like Kaila, Monica uses the spacious music and dance room once a week.

The **Collaborative Residency** program was Monica’s first experience integrating creative movement into the curriculum and she had no prior experience in teaching any kind of dance. The Arts First Summer Institute provided her first contact with instructional practices in this art form. Her motivation to participate in this program was her desire to grow and become a more effective teacher. She is a compassionate teacher, committed to her students. She acknowledged that puberty is a hard time for kids; insecurity and moody attitudes can conflict with experimental and risk taking behaviors, essential for learning. Monica connected with the students on a learning level – together they were learning from the artist, and her students witnessed her growth as both a learner and a teacher.

Naomi was also Monica’s teaching artist. They collaboratively planned and co-taught a unit based on the enduring understanding that enthusiasm fuels discovery, incorporating the essential question: How is energy transformed? Their unit implemented B.E.S.T. (Body, Energy, Space, Time) elements of dance to support students in creating a dance phrase to show the transformation of energy.

In the spring, Monica facilitated a coral polyp dance demonstrating the influences of biotic and abiotic factors forming its life. The task was: "Take your knowledge today and show what is happening in the coral polyps. Start in frozen shape, move, move, move, and finish in
another frozen shape” (Monica Observation Note, 2015, March 25). Students incorporated their knowledge from science classes, and applied prior skills in dance to choreograph, revise and perform a dance about coral polyps. The five student groups, mixed in gender, worked collaboratively to choreograph, rehearse, present and reflect. During peer feedback the students used science and dance vocabulary to analyze the dances according to their understanding about the coral polyp.

**Student Learning.** Monica noticed a change in student learning due to the integration of movement lessons into the curriculum. It appeared to her that dancing out the scientific facts studied in the classroom enabled students to have a deeper and more meaningful understanding.

**Representation.** The movement class offered students the experience to demonstrate their learning in multiple ways. They explained themselves kinesthetically through dance and verbally through explanation. Representing their knowledge with their body helped students to process the meaning; academic facts were put into action and their visualizations contributed to student learning. One student commented on this connection: “When you actually become that whatever you’re trying to do or show, it really sets that in your mind” (Monica Student Focus Group, 2015, March 25). Another described his process for learning through dance:

*First we learn about it, like actually on paper we study it, and then up here [in the dance room] we'll do something with it. And up here, I visualize it pretty well, because sometimes when we're in class I don’t get something, … but then my friends will help explain it to me. But I won't exactly get it until I move around. It's in movement I learn a lot more, like I can visually see.* (Monica Student Focus Group, 2015, March 24)
This student explained the multiple steps on the pathway to learning; text and discussion were helpful, but the added movement was what led him to understanding. One of his classmates supported this claim of the power of kinesthetic learning when he voiced difficulties understanding how energy is generated through dams: “I really didn’t get it [how energy flows through a dam] so when we started doing movement and then we had to make our tableaux, I could visualize ...the energy was going through the dam.” Monica described how another student explained how she constructed understanding through movement: “Before [in science classes], they were doing experiments with their eyes, like you watch something, but now [in movement classes] they get to do experiments with their bodies” (Monica Focus Group, 2014, December 6).

Reflection. Ongoing reflection questions throughout the lesson compelled students to apply science and dance vocabulary while verbalizing understanding. For example, students used academic language to revise their thinking about coral during one reflective segment of a lesson. One student stated: “Tim’s getting taller, he must be the polyp, they were circling them, different speeds…maybe biotic?” (Monica Observation Notes, 2015, March 25). During mass practices the teacher aimed reflection questions to help students improve their dances: “How can you make it more creative? – Anything you can revise to make it better?” and put a focus on creativity for the reflection of the final product: “How did they make it creative?” (Monica Observation Notes, 2015, March 25).

After each movement lesson, students wrote a reflection on their learning process in the two areas of dance and science. Monica perceived the benefit of ongoing reflection for improved understanding and critical thinking. She saw a direct connection between the mandatory Enduring Understanding (EU) and Essential Question (EQ) in the residency planning and students’ reflections. She stated:
The benefit of focus on the EU and EQ has been a direct link to what the students are doing. I am pretty excited about that, as students’ engagement is high, along with seeing deeper understandings of the science concept through the movement. The students’ reflections have grown and shown knowledge gained in science and movement. (Monica Interview, 2015, March 24)

Monica mentioned how a student explained how he and his classmates formed their understandings through action and reflection. She reported that the student said:

“Oh, I don’t get how this works and how that works,” but after they come up here [movement room], they're like, “Oh yeah, I get that.” Because you're going to see them do it and then explain what they did. (Monica Student Focus Group, 2015, March 24)

_The teacher as a role model for learning._ Students experienced a model for lifelong learning when witnessing their teacher’s growth as an instructor using dance. Monica provided dance instructions to her students before the residency started and students recognized a difference in her teaching during and after co-teaching with Naomi. They witnessed how their teacher learned from observing another teacher and how she was learning along with them. One of her students explained changes in Monica’s teaching “because she’s learning more and she knows how“ (Monica Student Focus Group, 2015, March 25). Monica explained her own learning process to her students and made her attitude towards learning transparent. A student concluded:

That anyone can learn new things. And that even after you're done with college, even after you're done learning everything that you can, that doesn’t mean that you're all done. There are still so many things you can learn. That kind of gives
me the encouragement to try different things up here and be different from
everybody else and just try the best I can because I know that I'm still going to be
learning after I'm done with everything. (Monica Student Focus Group, 2015,
March 25)

Students felt encouraged to take risks because they had a strong role model for doing so.

Joy of learning. Students looked forward to Wednesday movement classes where they were able to move freely without the ordinary trappings of a classroom. All four students in the focus group commented on the impact of enjoyment. One of the students specifically explained the importance of “having fun” while learning: “If it’s just boring, then you’re pretty much more thinking about other stuff. But if it’s not, you’re actually thinking about what the teacher or whoever is talking to you is talking about” (Student focus Group, 2015, March 25). Another aspect that contributed to their joyful learning was creativity. Students experienced the freedom to be creative; they were expected to use their imaginations. Monica worked with the students to distinguish the difference between imitating and interpreting something creatively. With respect to arts integration, Monica concluded:

It makes it so much more vibrant. And the learning is exciting and they like it.

When the time was done with Naomi, I was saying, “Okay, we’re gonna continue,” and they were so happy. They were so happy because it just made the science come alive. (Monica Interview, 2015, March 25)

The joy that came with movement and feeling more engaged in classes affected students’ confidence in learning. A student mentioned: “I think since we started it [movement], I learned a lot more in science than I ever did in pretty much my life.” (Monica Student Focus Group, 2015, March 24). Another student made reference to grade improvement:
If I was guessing on our grades, before movement started and after… it started to get higher and higher. And even though, . . . like some don’t like to come here as a movement, they still learn something, and I think that’s what is most important.

(Monica Student Focus Group, 2015, March 25)

**Teacher Change.** For Monica, participating in this professional development helped her understand cross-cutting concepts between art and science. She expanded on the similarities between the arts and science:

The vocabulary might be different, for example, the common process of exploration may be called creative play in the arts, while in science exploration is called experimentation. Yet, the outcome is the same . . . making sense of the world and answering questions. The arts and sciences are certainly more the same than they are different. The scientist in a lab designing a new form of solar panels is using the same creative processes as a dancer composing a movement sequence to reflect the sun's power. Both the scientist and dancer are trying to make sense of a problem. (Monica CR Reflection, 2015, March 24)

Putting the theoretical framework into her classroom with the help of the teaching artist led her to fully realize the natural fit of integrating movement and science.

**Self-efficacy.** Collaborating with Naomi increased Monica’s confidence and knowledge about teaching dance. The artist’s positive and encouraging approach provided her assurance, supported her ability to design arts integrated lesson structures, and gave students a fruitful learning experience. One student observed Monica’s teaching style evolve: “First it was just movement using your body. Now it's kind of using your body to show things in science. . . . And now she’s [the teacher] kind of using it in different things, she is kind of doing it in math”
(Monica Student Focus Group, 2015, March 25). The teacher’s enthusiasm about integrating movement flourished as she saw students grow:

In taking a closer look at the science lessons/concepts and how movement will fit, I find that my teaching of the science part has been raised up a notch. I am focused and excited with the lessons, and this directly impacts the students in a positive way. (Monica Interview, 2015, March 25).

Students valued the creative environment present within the space of the movement class. One student stated: “But out here she'll tell you, ‘You do your ideas. It's not what my ideas are.’ So she’s -- it's kind of two different personalities in the classroom and up here” (Monica Student Focus Group, 2015, March 25).

Pedagogy. The collaboration provided a structure for incorporating feedback to students as formative assessment. Naomi modeled how to observe and describe movements demonstrated by students. Through doing so, Monica began to see how to assess student understanding, provide valuable feedback for ongoing improvement, and collect information for subsequent lesson planning. Monica stated that she improved in interpreting students’ dance presentations to assess their learning: “Naomi showed me what to look for, like, ‘Okay, they are doing that.’ Some parts I wouldn’t think that they had it, but she would go like, ‘No, look. They were doing this’” (Monica Interview, 2015, March 25).

Frequency of the arts integration. Monica used the movement on a weekly schedule. Her ongoing professional development in drama beyond the Collaborative Residency program, her aptitude for arts integration and the joy she saw her students experience in learning encouraged her to integrate the arts more often – “At least two to three times a week” (Monica Interview, 2015, March 25). She explained:
I’m trying to spread out. I had done other class on the drama side more, and so we’ve been integrating the vocal traits and doing more things with their voice and how they’re reading things. I’ve done a little bit of visual arts too where they’ll create something that reflects, that’s showing what they know about that, so trying to do more than the dance too. (Monica Interview, 2015, March 25)

A student voiced her opinion about the frequency of movement classes:

I think it should be kind of something that you do every week because … it helps, but other people may not think that. … But everybody that I know, … [In class up in the movement room] they get up and do what they do and then they know how it works and they can show that. (Monica Student Focus Group, 2015, March 24)

**Influencing Factors.** A major influencing factor in Monica’s environment was the collaboration with the teaching artist, a trusting relationship that provided modeling and coaching experience in teaching artistic techniques. Monica experienced the school as supportive in allowing her to participate in this track of professional development.

**Relationship with the teaching artist.** The relationship with the teaching artist was defined by trust, support and appreciation. Monica mentioned the positive working relationship throughout the research process:

There’s so much. There’s the building of my own confidence, the increase of my knowledge about it [arts integration]. And just kind of Naomi’s attitude is really like this can-do thing, this is how it’s gonna do. And having just that support. Because even during the collaboration when I took over more, she was just so supportive. And having her to follow up and then say, “That was really good.
How about this or think about that?” And the way she did it was just -- it was good. (Monica Teacher Interview, 2015, March 25)

The co-teaching experiences cycled effectively with the planning sessions. Regular meetings with the teaching artist strengthened the lessons’ reflection questions and improved instruction. The collaborative partners bonded and they grew comfortable switching between instructional and assisting roles during the lessons.

*Modeling by the teaching artist.* Monica highly valued collaborative teaching; she learned how to provide movement instructions by watching Naomi model and scaffold the necessary steps. Monica voiced her appreciation: “We would not be where we were today if it hadn’t been for her [Naomi] and the building blocks of having that” (Monica Interview, 2015, March 25). With Naomi’s support, Monica developed arts integration skills such as the use of appropriate dance vocabulary and coaching techniques. She explained:

> I have gained so much from being a collaborative partner with Naomi. I am so thankful to have had this opportunity. I have grown as a teacher and added an exciting, engaging component to how I teach content. Through the collaboration, I have gained the skills, vocabulary, confidence, insight, and knowledge into how incorporating movement into the content area looks like and feels. (Monica Reflection, 2015, January)

*Time and space.* The spacious music and movement room allowed Monica’s students to move freely and explore space individually and in small groups. She considered the movement room a “great space” (Monica Interview, 2015, March 25). This space, physically separated from the traditional classroom, created an aura of unique privilege. Teacher and students referred to the movement room as, “up here,” a space with the distinct purpose of fostering
creativity. Even though Monica did integrate some movement within her own classroom, moving chairs and tables required extra effort, and the scale of movement shrank considerably. The lesson Monica shared during her spring observation would not have been viable in her classroom with its limited space.

Finding the time to integrate the arts was not a problem for Monica because she created a fixed block in her regular schedule. She was motivated to apply arts integration because of her students’ enjoyment and increased learning results, and she plans to continue to expand her teaching repertoire to include strategies from the visual arts and drama.

*Administration, colleagues, and parents.* Monica rarely mentioned administration, parents or colleagues involved in her arts integration work. When asked how her colleagues and administrators supported this work, she answered: “They’re not unsupportive, but they’re not super supportive. We [her colleague Kaila and herself] say, ‘Yeah, we’re gonna do this,’ and it’s like, ‘Yeah, that’s cool’” (Monica Interview, 2015, March 25). Monica was allowed to do this project and it did support the school’s vision, but she did not feel recognized for doing it, or notice others showing interest in it.

*Curriculum restrictions.* Monica did not feel restricted by the curriculum and considered the charter school structure responsible for the flexibility she needed:

Being at a charter school, we’re a lot more flexible, so it fits perfectly into my classroom and the demands that we have. And we have stuff to meet, standards and things like that, but I have a lot of flexibility in how I’m going to do things, so it fits right in (Monica Interview, 2015, March 25).
Cross-Case Analysis

Change is considered as a symbiotic exchange among the factors of personal perception, behaviors and environment (Bandura, 1994). The emerging themes across the three different cases were examined in the light of these reciprocal factors in order to illustrate their dynamic relationships. Findings according to student learning, teacher change and influencing factors were summarized across different data sources among the three cases. Evidence from different data sources converged and validated findings across the cases. Classroom observations, teacher interviews, student statements and teachers’ portfolios demonstrated convergence in findings and added to the validity.

It must be noted that teachers came into the program with individual teaching styles, personal assets, unique motivations, and differed in their focus. Monica started out with a desire to improve students’ creative risk taking but soon became intent on the students’ learning outcomes that occurred as a result of her teaching. Kaila and Abby were somewhat more focused on providing their students with quality arts experiences than on their own professional development. In addition to these distinctions, arts integration is an approach to teaching and not a curriculum, with room for individualization. Each teaching artist had a unique skill set, and each school context differed from one to the next. Nonetheless, several commonalities occurred between the multiple cases as a result of this model for professional development.

Teachers’ Personal Beliefs. Monica succinctly summarized a fundamental belief shared by all the participants of this study: “The art seems to open the door to enthusiasm in learning and discovery” (Monica Interview, 2015, March 25). Overall, the teachers expressed a positive perception of arts integration. They valued new teaching techniques that provided students
collaborative interaction and critical thinking, connected learning across content, and included both visual and kinesthetic construction of understanding.

**Engagement: Students were enthusiastic to learn.** All three teachers stated that student excitement for engaging the arts was powerful. Monica’s and Abby’s students demonstrated the ability to collaborate effectively to meet difficult creative prompts, resulting in high levels of focus and energy around their artwork. Kaila’s students struggled to stay on task and follow instructions during lessons, but found increased self-control when they were engaged in creative movement. Abby suggested that engagement occurred as a result of students taking more ownership over their ideas and their learning through artistic practice. Monica and Kaila found that the arts made school more interesting. What’s more, just as their students demonstrated enjoyment in learning through the arts, the teachers also expressed a sense of deep satisfaction and enjoyment when teaching through the arts.

**Self-efficacy: Teachers felt capable.** All three teachers explicitly stated that they “feel more confident,” especially after positive experiences with improved student behavior, engagement and learning through the arts. Kaila demonstrated an arts integrated lesson for her annual teacher assessment and received positive feedback from her administrator. However, not all teachers felt able to integrate arts to the same level as their collaborating artists.

Abby and Kaila expressed some anxiety about continuing to teach in the art form without the teaching artists by their sides. Both worried about how students would perceive differences between their facilitation styles and the artists’ styles. This dynamic was particularly interesting because they had repeated the Collaborative Residency program for multiple years. While Abby referred to a “bag of tools” she now has after her third collaboration, she demonstrated a lesson in which the art and the science content were somewhat divorced. Students drew details from
their texts, but were not involved in building conceptual understanding. The lesson seemed a safe approach for Abby.

Alternatively, Monica transparently addressed how she was learning right along with her students, taking risks and experimenting with her process. Kaila and Monica’s teaching artist challenged them to gradually take over more of the instructional responsibility over the course of their work together. Monica also expanded the repertoire of subjects into which she integrated the arts.

Teachers’ Behaviors. In all cases, teachers demonstrated changes in their instructional behaviors in response to their collaborations. They continued the arts and science integration practices after the completion of the program. Monica stated: “I am taking what I have observed and learned from Naomi, and I am putting that into practice” (Monica Interview, 2015, March, 25). Table four presents the teachers’ frequency of arts integration, their applications ranged from daily integration of creative movement, weekly scheduled dance lessons, and occasional visual arts integrated projects.

Table 4: Participants’ Frequency of arts integration

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Prior CR</th>
<th>Frequency of arts integration</th>
<th>Perceived curricular restriction</th>
<th>School type</th>
<th>Separate space for the arts</th>
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</thead>
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<tr>
<td>Abby</td>
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<td>Projects</td>
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<td>Traditional DOE</td>
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<tr>
<td>Kaila</td>
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<td>Low</td>
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</tr>
<tr>
<td>Monica</td>
<td>None</td>
<td>Weekly, daily</td>
<td>Low</td>
<td>Charter school</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Teachers used the arts as options for representation, expression, and engagement.

Across the cases, teachers referred to how arts integration has broadened their methodology for teaching and learning. It provided teachers with innovative tools to present new content,
facilitate more collaboration, refer to arts exemplars, and provoke creativity. Through the arts, students gained options for presenting their ideas. They communicated with their classmates to develop and exchange concepts and skills. Students discussed their creative products with each other, assessed them, and incorporated changes. Teachers combined drawing or movement with scientific concepts to facilitate student-centered construction of understanding.

*Teachers were more skilled in teaching the arts.* Across the three cases teachers demonstrated knowledge in teaching the arts and incorporated diverse instructional methodology, applied scaffolding, chunking, formative assessment, questioning, and student collaboration. The arts are complex in their process and require scaffolding for successful student learning. All teachers voiced that they learned “how to break things down” from observing and collaborating with the teaching artist.

Teachers emphasized that assessment became an important part in their lesson planning and demonstrated ongoing formative assessment while teaching. In the dance lessons the teachers coached by verbally describing student action as feedback. Abby, emphasized questioning as a tool for feedback to stimulate critical thinking, creative development, and independence.

*Teachers incorporated conceptual learning.* Interestingly, for their observed lessons teacher participants generally chose to replicate the unit they had taught with the teaching artist rather than demonstrate individual strategy use. Monica adapted her dance instruction about energy to the life of a polyp; Kaila had taught the life cycle of the mealworm in the previous year of collaboration with Naomi. The previous successful experience functioned as a model for future lesson planning and teachers transferred effective principles of instruction, including essential questions and enduring understandings, to new units of learning. With the integration of
essential questions and enduring understandings, student reflection on learning became an integral part of teaching, and Kaila explicitly stated this as an outcome of her collaboration with the artist. The ongoing student reflection supported student intentionality and insight into their own thinking.

**Teachers’ Environments.** The most valuable environmental factor for the teachers’ changes came from collaborative work with the teaching artists. Kaila reasoned: “I think the collaboration is much more effective because then you’re forced to do it, and you learn to do it. And then you like it, and then you’re in” (Kaila Interview, 2015, March 25).

**The teaching artist as a model and a coach.** Across the cases, the relationships with the artist were highly valued, seen as educative and supportive. The teaching artist was an expert who demonstrated art-teaching techniques, but also was a colleague to reflect, plan and improve instructions. The teaching artist also supported improvement through dialogue, observation and reflection questions. The teaching artist functioned as a role model for positive experiences in integrating the arts with engaged and successful students.

**Space as support.** Kaila and Monica had the advantage of a separate room with open space, and a fixed time block to support their regular arts integration in sciences. Monica’s students attributed creativity, a change in their teachers’ personality and enjoyment to this space that had a special status in their minds. Abby incorporated visual arts in her classroom schedule.

**Not enough time at the right time.** At the traditional DOE school the arts integrated science lessons were restricted to afternoon time blocks. Abby voiced her concern about this time restriction. The pressure to keep up with the mandated curriculum at the grade-level and a lack of collegial and administrative support seemed to challenge all three teachers in their perceived deficit of time. Although they identified time as a major barrier to arts integration, the
teachers in this study found elegant ways to marry arts standards with their required content standards in order to address some of these issues. Monica stated: “I can see that making the choice to integrate art into science will take some time and practice, but the excitement for both student and teacher will be well worth it” (Monica Teacher Portfolio, 2014, December).

*A lack of institutional support.* Teachers revealed that there was little exposure to, interest in, or support from their administrations and colleagues with respect to this project. The teachers received credits for their professional development activities, therefore the administration needed to give consent for the teachers’ participation. None of the teachers felt supported by their administration to deepen their arts integration practices or connect with mandated school curriculum. Kaila was able to recruit her colleague Monica to this route of professional development. Working at a public charter school, Monica and Kaila were given flexibility in scheduling their classes.
CHAPTER V Discussion

The results provided a rich description of teachers’ attitudes, beliefs, and practices regarding arts integration. Through this study of teachers’ experiences implementing the arts in their science curriculum, I explored existing practices, challenges and future directions for successful art integrations. In the following section, I discuss how these results respond to the research questions, reflect on additional aspects evolving from the analysis and discuss them in perspective to the literature and theoretical framework.

Personal perspective

The first research question was: What are teacher’s perceptions of integrating the arts? The participants believed that the arts offered students opportunities for successful learning experiences. They observed students being able to access and express understanding of content according to their abilities. Existing literature supports these perceptions. Gazzaniga (2008) explored cognitive development in learning through dance and movement, Simpson Steele (2013) referred to the support of an academic mindset, and Winner and Hetland (2007) identified creative problem solving that occurs through arts learning. Rabkin and Redmond (2006) indicated that an emotional connection to learning is cognitively powerful. Using creative movement to express the metamorphosis of a mealworm and the formation of a polyp provided students a personal experience to connect their emotions with learning about their environment.

Teachers’ confidence levels

The second research question was: What is the teachers’ confidence in teaching through the arts? Teachers developed self-efficacy by observing the teaching artist, having positive experiences collaborating with the artist, and receiving constructive feedback, all experiences that develop self-efficacy according to Bandura (1995). The ten collaboratively taught lessons,
along with the ten collaborative planning sessions offered multiple occasions for vicarious learning and raised teachers’ self-efficacy. All of the teachers felt empowered to continue this approach to arts and science integration, intrigued by success in student learning and higher levels of student engagement.

**Student engagement**

The third research question was: How do teachers perceive student engagement? Integrating the arts raises student engagement; this was perceived by teachers, students and demonstrated in the lessons. As suggested in the literature, the arts made school more interesting for students and teachers, and students found more joy in learning. This is consistent with other research on integrating the arts into other content areas (Winner & Hetland, 2001).

**Behavioral Perspective**

The fourth research question was: How frequently do teachers employ arts strategies? As stated in the cross-case analysis, teachers’ frequencies ranged from daily to occasional projects. There seemed to be no relationship between the number of times a teacher participated in the Collaborative Residency program and their frequency of application. This was a surprise, as our expectation based on the literature was that more exposure would result in higher skills and confidence integrating the arts, which would result in higher frequency of implementation. Abby, who had the most experience with the project, integrated the least often.

It is possible that the school was the most influential factor; the teacher who worked in a traditional DOE school with mandated curriculum and grade level mapping experienced the most difficulty finding time to implement her arts integration ideas. The sample size was very small, only three teachers, so it is difficult to generalize these results.

**Interactions with students**
The fifth research question was: *How do interactions with students change?* The findings do not allow an answer to this question, as there is no evidence about the teacher-student interaction before the collaboration with the teaching artist. More so, all teachers taught the students for the first time in the year of the collaboration, except for Monica. For her case it can be stated that the experience brought increased trust and respect as the students witnessed their teacher learn and improve her teaching using movement.

However, all of the teachers felt that integrating the arts with the help of a collaborative partner influenced their abilities to meet the needs of all students in their classrooms. As the literature indicated, teaching through the arts respects the diversity in student learning and accommodates students’ individual strengths and intelligences (Orek, 2004). Teachers adapted their pedagogy and demonstrated elements of Universal Design Learning (Glass, Meyer & Rose, 2013) as they implemented multiple means for representation, expression and engagement.

**Quality of arts strategy implementation**

The sixth research question was: *How well do teachers implement arts strategies?* The Collaborative Residency’s emphasis on conceptual learning influenced teachers’ future lesson planning. The principle of building a backward design based on big ideas (Wiggins & McTighe, 1998) helped the teachers establish meaningful goals for learning before choosing the instructional methods and assessment. This supports the idea of teaching students interdisciplinary processes where they are encouraged to make meaning and transfer their learning to other situations in life. Monica was able to seamlessly connect standards, learning objectives and enduring understandings. Abby used the essential questions they designed for the Collaborative Residency throughout the school year. The literature suggests that this metacognitive process stimulates independence and plays a crucial role in successful learning, as
students learn to choose the right cognitive tool for a task (Paris & Winograd, 1990). As this refers to students in the classroom it also holds true to the teachers as learners for implementing arts strategies.

**Environmental perspective**

The seventh research question was: *Is there a change in the organization of the school day and classroom?* During the collaborative residency the class schedule was adapted to make time for the teaching artist to visit the classroom. At the traditional DOE school this was restricted to the afternoon time blocks. At the DOE charter school the time schedule was more flexible and allowed for a regular fixed time in the morning schedule and the use of a movement room. The setup in the classroom was not affected by the collaborative work.

**Classroom curriculum**

The eighth research question was: *How does the classroom curriculum fit integrating the arts?* The common core standards include arts integration. Teachers are connecting the lesson to standards in the arts and in science. They acknowledged the easy fit of arts integration to the standards they were teaching. Still, limited time was seen as a restriction to implementing arts integration as stated by all teachers.

Research suggests that the organizational institution makes an important contribution to teachers’ professional development (Fullan, 2014; Supovitz & Turner, 2000). Though Goodson (2001) claimed that change starts within the person and begins within the school’s personnel, the institutional parameters and restrictions cannot be ignored. If there is no support from the school, the teacher’s inspiration to promote a change in her/his teaching approach will be limited and may not reach maximum potential. When teachers do not receive support from their colleagues or administrators to make room in the curriculum for the arts integration it may have a reciprocal
Collaborative Residency

Collaborative relationship

In addition to the above research questions, the collaborative relationship emerged as an important finding in this study. The teaching artist ignited changes in teachers’ arts integration and the work relationship influenced the teachers’ professional development. The role the teaching artist fulfilled over the extended time period of this program (including planning curriculum, modeling of teaching techniques, coaching, and providing feedback on student learning outcomes) is consistent with the key components of effective professional development as identified in the literature (Guskey 1985, 2002; Supovitz & Turner 2000; Thomas, Hassaram & Kinzer 2012). The professional development occurred over an extended period of time with active learning opportunities during the summer workshop and, most important, during the collaborative teaching. Further teachers were able to observe their students and were required to reflect on student development. All teachers noticed an observable and measurable impact on their students (Abby Interview, 2015, March, 24) (Kaila Interview, 2015, March, 25) (Monica Interview, 2015, March, 25). This collaboration provided a long term mentoring for the classroom teacher. As research about sustainable professional development demanded (Gulamhussein, 2014), the teacher was provided with time and space to exercise newly acquired techniques and received guidance and feedback in this process.

Conclusions

Educational research advocates for the importance of arts education at school (Catterall et al., 2012). The marginalization of arts in the curriculum may be partly remedied by capable teachers who integrate the arts into other subject areas. Though arts integration cannot replace
valuable arts instruction in discreet disciplines, it can support student understandings of other content areas through artistic expression. In order to do so, arts integration must receive status beyond that of “fun” and “frill,” and teachers must practice their pedagogy with rigor. The Collaborative Residency offers multiple situations in which teachers can observe the teaching artist incorporate art techniques; this vicarious learning situation is fundamental to this professional development and offers teachers a chance to embark on a reciprocal transformation of personal beliefs, behaviors, and an adaption of their environment to become better arts integrators.

In conclusion, teachers gained self-efficacy through experiencing the arts as a joyful endeavor for both students and themselves. In accordance with the literature, this had a reciprocal effect on teachers’ behaviors as they applied arts strategies and implemented a pedagogy focused on constructivist learning supported by scaffolding and formative assessment (Orek, 2004; Guskey, 1985; Bandura, 1995). Bandura’s reciprocal model served well as a framework to make meaning of the data being collected in this study. The mutual interactions of the teachers and their own professional development, changes in teaching strategies and classroom behaviors, and the environments of schools and classrooms all affected the success of arts integration.

The strongest positive influence on teachers’ beliefs and behaviors was the interaction with the artist. The Collaborative Residency met criteria for successful professional development (Supovitz & Turner 2000) and provided teachers experience, knowledge, guidance, and most of all, growing confidence (Bandura, 1995). Aspects of the environment served as barriers or facilitators, in some cases restricting time for implementation of the arts, especially if teachers were not supported by school policy. Such limitations could place a cog in the reciprocal cycle of
change, lessen beliefs about the positive effects of arts integration, and restrict teaching behaviors. This study is an example of the importance of social interaction in the process of professional development.

**Implications for Practice.** Dewey stipulated that the arts in education should be provided to all children in U.S. schools (Dewey, 1910). Nevertheless we see a shortening of the arts in the public school system in Hawai‘i (Wong, 2013). In times of limited resources, we need to analyze sustainable outcomes from professional development to determine how to best equip teachers with quality development in the arts. This study aims to contribute to a political environment, which will understand the importance of the arts in education to influence decisions about policies and practices in our educational system.

Collaborating with a professional is demonstrated to be a valuable learning experience for teachers. The structure of the program successfully incorporated aspects of quality arts instruction and conceptual learning. The teaching artists were well trained as specialists in their art forms and proved capable of supporting teachers in their development. The collaborative planning time ensured ample time for reflection and analysis while the partners built trusting relationships. Teachers felt well supported by the program.

A stronger emphasis might be placed on institutional supports for teachers. Simple approval is not enough; administrators need to get involved in order to be recognized as key stakeholders for arts integration practices to flourish. Administrators need to defend the time needed for arts integration and allow for flexibility in the classroom schedule and structure of the school day. An optimal solution involves a stronger integration of the arts in all school subjects and arts integration professional development within the schools’ agenda. Assuring teachers more flexibility in their schedules would increase their opportunities to employ the arts.
The teachers voiced that they did not feel supported by their administration, colleagues or parents. Incorporating student-centered products could increase the recognition of the students’ abilities and the power of the arts. Exhibiting and presenting student work could raise parent participation and involvement in schools. Finally, there is power in facilitating memorable experiences such as performances and exhibits that contribute to students’ enjoyment and engagement in school (Smithrim & Upitis, 2005).

There were multiple reasons for teachers to participate in the Collaborative Residency. In this study, teachers showed intrinsic motivation to offer their students a different approach in learning. In the future, the program might raise teachers’ awareness about their motivation to participate, and emphasize the teachers’ individual goals for development. The work of education usually has the student at the core, and it is a rare moment when teachers place their own needs first, developing knowledge and skills that spark the teachers’ passions as professionals.

Another aspect to consider is students’ behavior. Across the three cases students demonstrated an increase in their engagement and participation in class. Kaila’s students showed less disruptive behavior and improved concentration; Monica’s students highly valued the experience of the movement lesson and discovered a connection to their improved learning outcome and understanding. According to Guskey (1985) a positive effect on students’ achievements is considered as fundamental for teachers to adapt their newly acquired teaching behaviors.

Limitations. This case study research with Hawai‘i teachers may not be generalizable to other school districts, professional development programs, locations or populations. The experience of the Collaborative Residency is unique in its circumstances and even though a
professional development might be similar in its structure, the educational situation in Hawai‘i adds to its uniqueness. Findings do, however, contribute to a growing understanding about qualities and characteristics of effective professional development in arts integration, may be counted among other case studies addressing teacher change, and can inform other efforts in teacher training with similar arts integration goals in teacher training. As this body of research and knowledge grows, patterns of findings among the studies will become increasingly generalizable.

This research emphasized internal and environmental determinants for teacher’s behaviors. Therefore Bandura’s social cognitive theory was used as a theoretical perspective to determine data sources and to organize the results; another theoretical framework might have included different emphases. For example Bandura’s theory neglects explaining changes in the personality and motivation over time, and a theoretical framework such as Bronfenbrenner’s Ecological Systems Theory (Bronfenbrenner, 1979) could have addressed the development of the individual as part of the life course. Another aspect not being addressed is the interaction between teacher’s development and any cultural influence. A sociocultural perspective, such as provided by Vygotsky (Vygotsky, 1978) could have included teachers’ cultural background and interaction in their environment. This demonstrates that another theoretical framework would have lead to a different approach in data collection and analysis.

**Future Inquiry.** It might be of interest to compare the practices of a group of teachers who are interested in integrating the arts but have not experienced an in-service program such as the Collaborative Residency, to those who have. Another interesting comparison might occur between teachers who have been through the program multiple times and teachers who participated only once. Results from this small study indicate that the number of years with the
program did not affect the outcomes of these participants, but dispositions and motivations may be more influential factors. Another aspect that evolved from this study is the transfer of arts integration pedagogy to other areas of teaching. Do teachers who evolve as arts integrators change as teachers in general? It would also be worthwhile to track how the teachers’ integration with the arts evolves over time— if their practices improve or devolve as they move further from the professional development and its support. Further, longitudinal studies about teachers’ reasons for ongoing professional development in arts integration or reasons for discarding the practices are worthwhile of further investigation.

Inviting professionals into schools and the influence of collaborative work for teachers in the realm of professional training has been documented for the Collaborative Residencies in this study. Other research has been done on collaborative work relations between schoolteachers and professional scientists. A comparison between these studies in order to demonstrate similarities and differences may contribute to knowledge about the beneficial factors of collaboration among professions. Further it is of interest what other forms of cooperation with professionals are being practiced at schools in Hawai’i and whether outcomes might be similar for teacher’s development and the impact on student learning. Critical reflection on partnering with professionals in the schools could encourage or discourage further collaborations.
References


Rytivaara, A. & Kershner, R. (2012). Co-teaching as a context for teachers’ professional


Wang, M. T., & Eccles, J. S. (2013). School context, achievement motivation, and academic


Appendix A: Teacher Focus Group Protocol

1) TEACHER LEARNING: New knowledge, skills and attitudes about teaching and learning through the arts as a result of the Arts First Institute

   a. How did the institute influence your understanding of art/science connections?

   b. How did the institute influence your ability to teach integrated art/science content?

   c. What were some struggles or challenges that you faced in planning, instruction and/or assessment?

   d. What preparation or practice would you need to improve your facilitation skills?

   e. What are some of the most useful things you are taking away from the institute?

2) STUDENT LEARNING: Impact of arts integrated instruction on students.

   a. How did you assess student learning in the arts? In science?

   b. Describe positive/negative impact(s) on student behaviors, attitudes, or dispositions you have observed as a result of the workshop.

   c. Describe positive/negative impact(s) on student learning you have observed as a result of the workshop.

3) INSTITUTIONAL SUPPORT: The DOE and school support of teacher development.

   a. Describe ways the DOE encourages or discourages your growth as a teacher who integrates the arts in your classroom.

   b. Describe ways that your school encourages or discourages your growth as a teacher who integrates the arts in your classroom.
Appendix B: AFI Facilitator Interview Protocol

1. Teacher Learning
   a. Did you observe different forms of co-teaching within the Collaborative residencies teams? Which one was favored?
      i. (one teach-one observe or assist; Stations; Parallel; Team)
   b. Where the students engaged in a creative process (which one) that collected the arts form and science and
   c. Did the students demonstrate an understanding of the scientific process though the art form?
   d. Did the lesson implied crosscutting patterns?
   e. What were some struggles or challenges you observed in the implementation of the lesson plan?
   f. On a rating scale from 1 to 5 how comfortable and successful would you rate the teacher employing the art form?

|--------------------|-----------------------|--------------------------------------|--------------------------|---------------------|

2. Student Engagement:
   a. Did the students take active part in questioning and thinking? Where they alert in the beginning of the lesson?
   b. How did you notice student engagement?
   c. Was there a particular student behavior that is worth mentioning, or was mentioned by the teacher/ teaching artist?

3. Professional Development:
   a. How did the collaborative team implement the concept of EU- Enduring understanding and EQ- Essential Question? Were they represented in the room?
   b. What difficulties did the teaching team challenged?
   c. Any structures/content of the PD seemed to be supportive? (Either teachers mentioned it or you saw it well implemented)
Appendix C: Teacher Interview Protocol

**Material:** audio recorder, healthy snack and drink

**Time:** 45 min. at a time convenient to the teacher in a place where there is no disruption.

**Prior to Interview:** In consultation with student(s), teacher will select samples of class work for students participating in the focus group.

**Procedure:** After introducing the project, explaining the research goals, attaining consent and attaining permission to record, the interviewer will ask questions aligned with the following prompts, extending and probing as required to elicit elaboration, examples and explanation.

**Items:**

1. Tell me about your experience with integrating the arts and science in your classroom this year.
2. How does arts integration influence the environment of your classroom?
3. How do students socially or emotionally react when you teach through the arts? Do you see any difference in engagement? Why do you think that is?
4. How do you think your arts integration supports student learning?
5. Now we want to talk about some of the student work examples. Tell me more about how you selected these samples? What does this work tell us about these students? What does it tell us about their growth?
6. How did your collaboration with a teaching artist influence your:
   a) Planning
   b) Instruction
   c) Assessment
   d) Mindset
7. On a scale from 1 to 5 how often do you integrate the arts **after** the residency? Why?

<table>
<thead>
<tr>
<th>1. Daily</th>
<th>2. Weekly</th>
<th>3. Once or twice a month</th>
<th>4. Less than once or twice a month</th>
<th>5. Not at all</th>
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8. On a scale from 1 to 5 how successful do you feel integrating of the arts in your science classes after co-teaching with the teaching artist? Why?

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9. What are some of the things that support your integration of the arts?

10. What are some of the things that hinder your integration of the arts?

11. Does the integration of the arts influence the organization of the school day? To the advantage/disadvantage?

12. How do you fit the arts into the science curriculum?

13. What do you take from the collaborative experience with the teaching artist?

14. What would you need from the *Collaborative Residencies* in order to better support your development as a teacher who integrates with the arts?

15. Is there anything else you would like to share about your professional development experience with this project?
Appendix D: Student Focus Group Protocol

**Location:** __________ Elementary School

**Time:** 45 min., at a time and place after school that is convenient for the participants.

**Materials:** apple juice, healthy snack, video camera, audio recorder,

4 bags with labels: fun, feeling interested, getting to move around, understanding science, understanding myself, working with others, getting big ideas, asking good questions, feeling creative, becoming an artist, etc.

4 bags with empty labels, 4 pens; chart paper, markers (different colors)

**Procedure:** Interviewer will ask questions aligned with the following prompts, extending and probing as required to elicit examples, elaboration and explanation.

1. **Introductions (5 min.)**

   In a round-robin style, students provide a) names; b) favorite subject in-school; c) favorite activity out-of-school

2. **Research Project Overview (5 min.)**

   The study’s goals, consent and assent will have been addressed in an informational meeting prior to this focus group. The facilitator will ensure participants are aware the session is being video and audio taped, but neither the video nor the audio will be shared with anyone at any time and will be destroyed when the study is done, remind students of their rights, provide an overview of the goals for the focus group, and remind students of the confidentiality of the focus group.
3. Focus group prompts (30 min.):

a) Do you remember when the artist was teaching with your teacher? Let’s all agree on a lesson that is very memorable for you. Describe it. What did you learn?

b) Here is a bag with some labels in it. First, group all the things that helped you learn in one pile, and all the things that you didn’t notice or didn’t help in the other pile. Tell me about your choices.

c) Now put all the things that did help you learn in order – what was the most important? Least important? Tell me about your choices.

d) Let’s look at some of the work you completed when you were learning arts/science together. What is interesting about this work?
e) Not applying for first graders: Can you find a title for your work in learning arts/science together? (Interviewer writes the title(s) on the chart paper.)

f) Now let’s talk about your teacher. What is she like when she teaches science and the arts together? Describe her teaching style. Please tell me some words that best describe it and I write it on the labels. (Interviewer presents the results and checks with participants, adds adjectives if necessary)

g) Now let’s talk about what she’s like when she teaches the “regular” content, when you are not using the arts. Is her teaching style different? (Interviewer collects results on the chart paper)

h) Is there anything else you’d like me to know about your experience with the arts in your science classes?

4. **Closure (5 min.)**

Facilitator will thank students and say good-bye. First graders might enjoy playing the game “Simon Says.”
Appendix F: Blumenthal Performing Arts Center Evaluation Form

6. Collaborative Residencies: Classroom Observation

(Blumenthal Performing Arts Center Education Institute)¹

School: ____________________________________________________________

Date: _____________________________________________________________

Teacher/Artist: ____________________________________________________

Title of lesson: ____________________________________________________

Grade level: ______________________________________________________


Student Engagement Indicators

Starting time ___________ Ending time ___________

Observation Time Line (in 5 min. segments): The lesson consist of 9 segments, each lasting 5 minutes. If the description of the students engagement indicator can be observed in a segment, the box can be checked.

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<tr>
<th>Student Engagement indicators</th>
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<th>3</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Tally # boxes checked</th>
<th>% of total class time</th>
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<tbody>
<tr>
<td>1. Students were actively listening or watching the teacher, artist, or other students by focusing attention and making eye contact with the presenter</td>
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<td>2. Students were responding to teacher or if there, to the artist prompts.</td>
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<td>3. Students were actively participating in questioning, exploring, brainstorming, or discussion of learning topic with the teacher, artist, or each other.</td>
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<td>4. Students were engaged in working with each other, the artist, or teacher.</td>
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<td>5. Students were engaged in activities that required decision-making or problem solving.</td>
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<td>6. Students were either participating in arts activities or volunteering to participate.</td>
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<td>7. Students body language was open and relaxed, with appropriate smiles and laughter.</td>
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### Instructional Indicators

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<thead>
<tr>
<th>Instructional indicators</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Randomly</th>
<th>Seldom</th>
<th>Not at all</th>
<th>Score</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1. Involved all students by requesting and inviting equal participation.</td>
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<td>2. Used active, experiential instructional approaches.</td>
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<td>3. Created an emotionally safe learning environment where taking risks and making mistakes is okay.</td>
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<td>4. Provided opportunities for students, artists, and teachers to collaborate and work together.</td>
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<td>5. Demonstrated respect for all learners by encouraging individual expression, responsibility, and decision-making.</td>
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<td>6. Connected the current lesson to students' previous learning experiences.</td>
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<td>7. Used multiple ways to convey the lesson, including but not limited to questioning, illustration, demonstration, and modeling.</td>
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### Lesson Plan

<table>
<thead>
<tr>
<th>In the integrated unit of study:</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
<td>1. Students were informed of the purpose or goal of the lesson/unit.</td>
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<td>2. Meaningful connections were between science and arts.</td>
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<td>3. Activities were age- and grade-level appropriate.</td>
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<td>4. In depth learning was promoted.</td>
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<td>5. High-quality examples from the arts and other disciplines were used.</td>
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<td>6. Terminology was appropriate.</td>
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<td>7. The artistic processes of creating, performing, and responding were incorporated.</td>
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<td>8. Assessment was ongoing throughout the lesson, with appropriate feedback provided.</td>
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<td>9. There was a final evaluation of student learning.</td>
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Additional comments of the lesson: