

“Putting...Celery Stalks in the Red Water”: Inquires & Insights from a Pre-Service Action Research Project

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Abstract: *This paper discusses a teacher candidate’s experience and lessons with action research during clinical practice. It demonstrates a model of teacher as researcher at the pre-service level and the effect on classroom students’ academic achievement, in this case literacy development. We posit that using action research as an inquiry tool at the pre-service stage allows teacher candidates to gain invaluable knowledge and skills as they teach to learn and not simply learn to teach. It is our hope that teachers and teacher educators alike can gain insight from this project, which was developed and implemented during clinical practice.*

Keywords: *Action Research; Interdisciplinary Curriculum; Early Childhood; Student Teaching; Clinical Practice.*

1. INTRODUCTION

Each year senior level teacher candidates in an undergraduate teacher preparation program conduct a capstone action research project with school-aged students in their practicum sites. They are tasked with enhancing teaching and learning during pre service teaching as they work to gain valuable skills and knowledge to enter the urban classrooms. This paper highlights the second author’s action research project about interdisciplinary curriculum that sought to understand more about early childhood students’ literacy development. It is our hope that teachers can learn from the curriculum and its pedagogy, and perhaps understand more about the methods to engage student teachers that allows them to have impact on students’ academic outcomes. We highlight the process from various stages and demonstrate the kinds of reflection action research calls for. The exemplar interdisciplinary curriculum illustrates the impact that action research has on student learning, with particular focus on student literacy.

Our teacher preparation program is part of a small Education Department located in a major urban city in the Northeast United States. Teacher candidates are placed in partner schools in the surrounding neighborhoods. During the Clinical Practice Seminar (student teaching seminar) teacher candidates are required to conduct a capstone action research project, which they develop during the fall semester and implement during the spring semester. Teacher candidates have the opportunity to investigate a topic of interest or concern, develop an action plan and implement an innovative intervention program for the students with whom they work. While our overall department works to develop reflective practitioners in all its course work who act as change agents in schools, communities and classrooms, a project of this extent and intensity is new to most students.

Developing and implementing an action research project offered an opportunity for the second author as a teacher candidate to hone her skills as a reflective practitioner and for students in her class to receive new pedagogical approaches based on research-based practice. Excerpts from conversations with the classroom students discussed later in this paper reveal a sense of excitement, as they seemed eager to make meaning of new knowledge. When the second author began student teaching her students had little to no knowledge of fictional tales and story elements. Her reflection illustrates that not only were students enthusiastic about learning, their literacy knowledge increased as they were able to use content based vocabulary to describe the story elements. Teacher researchers are reflective of their practice and are more willing to modify instruction and pedagogical understanding based upon student learning (Sutter, 2006); a lesson that the second author grasped as she engaged in the process of action research, which called for continuous reflection and instructional modification.

2. ACTION RESEARCH: TEACHER CANDIDATES AS TEACHER RESEARCHERS

Action research emerged because of the growing need to connect social science knowledge to the day-to-day practices of teaching (Nolen & Putten, 2007). Small & Uttal (2005) purport that “the purpose

of action-oriented research is to generate knowledge that can be used to address practical concerns of local communities, organizations, and groups and incorporate local understandings of specific practices and issues” (p. 938). But teachers often feel that research about teaching is irrelevant to their daily lives (Breidenstein, 2002; Cochran-Smith & Lytle, 1992), and have overwhelmingly dismissed educational research. Additionally, researchers have historically blamed teachers for the failures of schooling and the failure of students (Cochran-Smith & Lytle, 1992). Action research might be able to address all of these issues and barriers, because, as teachers become researchers themselves, they are able to learn the value of research from the inside out. Teacher researchers are situated in a unique position to learn from their own practices and also provide knowledge that not only adds to the field, but generates new knowledge (Breidenstein, 2002). As will be discussed later in this paper, teacher candidates learned more about their students and students’ needs, and found that action research served as a tool of self-discovery.

Novice teachers often feel ill-equipped to successfully educate their students for many reasons, including, but not limited to: (a) spending insufficient time in classrooms during pre-service years (Brouwer, & Korthagen 2005); (b) receiving theoretical knowledge that seems not applicable to the actual students with whom they work, and (c) lacking the skills to adequately deal with the unpredictability of teaching. Since action research can be done with one student, an entire class or an even an entire school, it enables educators to more adequately deal with challenges that may surface in their actual classrooms and schools. It is also a systemic approach for teachers to investigate their effectiveness (Pelton, 2010); in other words, are students learning what we are teaching? If given the opportunity and skills at the pre-service level to engage in the kind of learning that is based in inquiry and that can potentially give rise to real insights, teachers will feel more confident about teaching and also engage in the kind of teaching that enhances student achievement and their pedagogical skills on a continuous basis. In addition, teachers need to apply, read and analyze data in their professional lives— action research provides this learning experience.

Teacher education has recently been given more attention as the United States moves toward an educational system that focuses on performance based learning and one common set of standards known as the common core standards. We posit that teacher education providers must embrace inquiry based learning and teaching to prepare innovative teachers who are will successfully engage and improve student learning and achievement especially in a rapidly changing educational world. In addition, action research provides classroom teachers with an approach to examine their practice. Beginning this process of data inquiry and data driven instruction during the teacher preparation stage adds to teachers’ skill and capacity upon entering the classroom. Phelan (2005) notes, “inquiry-based teacher education embraces the importance of experience and its interpretation” (p. 342). Providing teacher candidates with complex knowledge but insufficient experience inhibits their success as future teachers. As a teacher educator, the first author often struggles with getting teacher candidates more involved in the classroom and engaging in hands on teaching for several reasons: (a) Candidates may be nervous about conducting whole class instruction in the initial months of student teaching; (b) classroom teachers may hesitate to fully relinquish their classrooms to pre service teachers; (c) candidates may display behaviors that suggest that they are not ready for whole class instruction. Allowing teacher candidate to receive the full scope of teaching that occurs during this experiential stage of teacher preparation is important as mistakes and errors are viewed through a more critical and reflective lens, rather than an evaluative one. Doing so, allows teacher candidates to examine themselves as educators and come to terms with their strengths and the areas where growth is required. Breidenstein (2002) highlights that, “interns reported that they had gained insight about themselves as researchers and teachers, particularly in the moral, personal, and political dimensions” (p. 315).

3. EXEMPLAR METHODOLOGY AND DESIGN

3.1. Interdisciplinary Curriculum

An interdisciplinary curriculum is a holistic approach that links disciplines by emphasizing their relationships and connections (Smith and Karr-Kidwell, 2000). Through the use of this curriculum, students become more actively involved in their learning so they are better able to retain concepts. Student are able to augment essential skills such as communication, investigation, reading, writing, listening, speaking and thinking as they use prior knowledge to make choices and work collaboratively and cooperatively with their peers (Colombo, Sadowski & Walsh, 2000). Grady

(1994) noted specific attributes of an interdisciplinary curriculum: 1) It provides avenues for teachers to reinforce and refine the knowledge and skills of students. When a concept is first introduced to students, a teacher cannot assume that the entire class has grasped the concept; (2) It provides opportunities for student participation in coherent learning experiences. Children need to make logical connections between what they are learning with other subject areas and their environment; (3) Students are able to confront content and reach high levels of abstract thinking. Problem solving skills are crucial to students' academic attainment; (4) It emphasizes inquiry, analysis and understanding of content, and (5) It is a multisensory experience where students learn to integrate strategies from the classroom to the world that they live in. These attributes nurture the whole child as well as increase students' academic attainment.

3.2. Research Questions

Prior to commencing the research project, the second author conducted informal interviews to assess the current curriculum used by the classroom teachers in the school in which her student teaching was conducted. Conversations revealed that a traditional subject centered curriculum was used. Smith and Karr-Kidwell (2000) defined the traditional-subject centered curriculum as a method where each subject is determined by a specific amount of time, and students move from one subject to the next without making connections across subject areas and real life. Preliminary conversations made the second author realize that in order to help students make connections between the subjects, teachers needed to engage in another pedagogical approach, one that allows students to make deeper connections to their lives. This led to the creation of a set of research actions that guided the action research project: The second author's action research project aimed to answer the following questions: (1) How does an interdisciplinary curriculum unit impact the learning of elementary school students in a Collaborative Team Teaching (CTT) class? (2) Can an interdisciplinary curriculum help improve the social and emotional behaviors of elementary school students in a CTT classroom? (3) How can elementary school teachers structure an interdisciplinary curriculum, so that all the learning needs of their students in a CTT classroom are met? Overall, we wanted to increase students' literacy and academic engagement by using a more holistic and interconnected curriculum that makes greater meaning of students' lives and learning.

3.3. Setting

This action research was conducted in a public school in a large urban community. The school catered to a racially and ethnically diverse population of 559 children from kindergarten to fifth grade. The majority population was of African descent (80%) which included African Americans, continental Africans and African Caribbean students. Other groups included: Latinos (16%), European Americans (2%) and Arabs (1%). The school had both general and special education programs. The gifted and talented program, which began in 2005, was being phased out with the last class scheduled to graduate in 2012. The school provided Supplemental Educational Services for students who needed help in reading, English language arts and mathematics, before and after school.

3.4. Participants

The participants for this qualitative action research project, were twenty-three second grade students in a CTT class, whose ages ranged from seven to ten years old. The class consisted of 11 boys and 12 girls and seven of the students had an Individualized Education Plan (IEP). The recommendations for the IEP included instruction in English Language Learning (ELL) and mathematics (2 students), speech and language therapy, occupational therapy (2 students) and counseling (3 students). For speech and language therapy, and occupational therapy the students were pulled out of the class for 30 minutes per session, 1 to 2 times a week depending on the needs of the child. The students for counseling attended group sessions of 3 students, 2 to 3 times a week.

3.5. Data Collection

Before creating and implementing the interdisciplinary curriculum the second author conducted an interview with the classroom teachers to explore their views of the curriculum being used at that time. The goal was to understand if the curriculum effectively met the needs of the students in the CCT class. The teachers indicated that a traditional subject-centered curriculum was used.

In order to effectively plan activities that would suit the learning styles of the students, students were given the Multiple Intelligences Assessment for Early Childhood as a pre-test, one based on Howard Gardner's Theory of Multiple Intelligences. With the results of the test and the classroom teacher's

knowledge of the students, it was noted that the major learning styles of the students were musical, verbal-linguistic, bodily-kinesthetic and visual/spatial. Appropriate activities were planned during each lesson to cater to each learning style.

Using the theme of Fairytales, Folktales and Fables, an interdisciplinary curriculum/unit of six lessons was created to teach various concepts (adjectives, problem solving with money, parts of the plant we eat, answer 'wh' reading comprehension questions, using context clues to define words, identify and name the seven continents, modes of transportation and antonyms and synonyms). Students engaged in a group work and at the end of each lesson, they were given various independent activity sheets, based on their academic ability. Samples of students' work were collected and analyzed. The students were also given a summative assessment at the end of the unit.

When the unit was completed the students and classroom teachers were interviewed. The students' interviews were based on their feelings about the unit and the teachers' interviews were based on their observations as the unit was taught.

The Curriculum. Using the state standards as a guide, a calendar with appropriate activities was created using the theme of Fairytales, Folktales and Fables. The interdisciplinary curriculum unit consisted of six lessons teaching various concepts in language arts, science, social studies and mathematics. The lessons were taught over a four-week period with each lesson being approximately thirty to thirty-five minutes long. Throughout the learning, the students engaged in numerous interactive hands-on activities such as completing graphic organizers, coloring and labeling diagrams, locating places on a map of the world, drawing pictures, creating and performing songs and poems, making predictions and carrying out scientific experiments.

In promoting literacy in the classroom, each lesson required the students to read various paragraphs, answer reading comprehension questions, use context clues to define and explain challenging words or phrases and give examples of synonyms and antonyms for words in the texts. Students also identified the characteristics and parts of fairytales and wrote their personal views describing their feelings about explicit story elements.

Sample Lesson. Passmore, Stewart and Cartier (2009) explained that many countries, including the United States, have been concerned about science education in schools. They noted that upon graduation from secondary school, many students lack understanding about the fundamental ideas in science and many of them do not pursue studying the subject at a college level. They are of the belief that when science instruction is unexciting and unclear, some basic goals of science education, such as the development of inquiry skills, fail. Based on the class schedule, the second author noticed that more attention was given to mathematics and literacy and little time was spent on science.

The science lesson used the story of *Jack and the Beanstalk*. State standards require students from K-5 to identify and compare the physical structures of a variety of plant parts and understand that each plant has different structures, which serve as different functions in growth, survival and reproduction. For this lesson the story of *Jack and the Beanstalk* was rewritten and sang to the tune of BINGO, which was typed and placed on the classroom's smart board. Using context clues, the students were asked to define some words from the song and also to give suitable synonyms and antonyms for selected words. Students were asked to examine and identify the different parts of a plant. After this, the students were allowed to conduct an experiment in which they would show their knowledge of plant parts in a real world setting – the experiment. Using pre-soaked lima beans, they were able to dissect the bean and identify each part. It was amazing to see the excitement on the faces of the students as they worked together. One student exclaimed, "I am having so much fun!" It was amazing to see students engaged while learning science and developing their literacy skills.

In integrating the other subjects, the students were given a longer version of *Jack and the Beanstalk* to read. After reading the story, the students were asked to write a friendly letter to a character in the story, explaining what their favorite parts of the story were and why it was their favorite. Knowing that *Jack and the Beanstalk* is an English folktale and that the New York State standards requires elementary students to learn about other cultures for social studies content, using a map of the world the students were asked to identify England and state which continent it belonged to. Utilizing the computers in the lab, the students worked in pairs to expand their knowledge about England. Using pre-identified websites, they were asked to compare and contrast England's flag with that of the United States; identify the language spoken and compare the spelling of some English words with the American spelling (color, favorite); identify some sports which are indigenous to England such as

cricket; and identify other fairytales from England such as *The Three Little Pigs* and the story of *Goldilocks and the Three Bears*.

For mathematics, using the animals from the story, problems were created for the students to solve. For example, “If the giant had six hens and each hen laid 3 golden eggs, how many golden eggs would the giant collect altogether?”

3.6. Findings and Implications

Children learn when they are actively involved in the learning process; the exemplar action research revealed that when a classroom has an effective curriculum, academic achievement increases. By effective, we mean a curriculum that explicitly addresses the diverse and unique needs of all the students and empower teachers to have the flexibility to be creative and innovative, as they employ multiple teaching strategies to enhance the delivery of their lesson. Below are some examples of students’ responses to the interdisciplinary curriculum discussed in this article:

Alan: “Ms. C what activity [do] you have for us today? Are we going to use the musical instruments?”

Rawl: “Ms. C, are you coming to teach us again? I like your lessons. They are fun.”

Janny: “Can we do the same experiment again? I love when we do the experiments. Putting the celery stalk in the red water was exciting.”

3.7. School Curriculum from a Teacher’s Viewpoint

With the need to promote literacy, the classroom teachers admitted that they were following the state’s traditional subject-based curriculum, which focused minimally on the mental self (Johnson, 2011) rather than the whole child. It did not provide opportunities for them to be innovative and use a variety of instructional approaches or strategies. Most of the teaching was done using ‘chalk and talk,’ and although the curriculum issued clear goals and objectives for the students’ progression, it was unsuitable for their CTT classroom as many of the students had IEP’s and needed more one on one instruction.

Both teachers concurred that the curriculum ensured that they were adequately taught to implement it, as the teaching resources were explicitly explained on how to teach each lesson with its main focus on mathematics and literacy. Teachers noted that there was not enough flexibility in implementing the curriculum to suit the learning needs of students in a CTT classroom setting and the principal or other teachers did not allow them to adapt the curriculum to suit the learning needs of the students in their class. “If we are not teaching the same topic as the other teachers, they get upset and the principal will ask us to explain why we are behind. We have to work at the same pace as the other teachers who do not have the same problems [academic, behavioral] as we do.” Frustration engulfed the teachers as they lacked the flexibility to maximize strategies that would guarantee that all the students would achieve academic success. Their main concern was that the special education students would be left behind.

3.8. Familiarity with a New Literary Genre

The students’ knowledge about the characteristics and parts of a fairytale and folktale increased, and, by the end of the unit, they were able to specify characteristics of this literary genre. The New York State Learning Standards for English Language Arts for grades P-12 states that second grade students need to understand the literary elements of setting, character, plot, theme, and point of view and compare those features to other works and to their own lives.

Chris: “A fairytale has magic and people with swords and a lot of bad people. The good person does fight the bad people and win.”

Ana: “A fairytale has princes and princesses and wicked step mothers... It has a setting, problem and solution and many characters.”

Catherine: “Fairytale have lots of magic and giants. Some of the giants are bad ... Fairy tales always have happy endings. I like happy endings.”

These statements demonstrated that students now had a clearer understanding of the parts of a fairytale and were also able to give examples, using their own words.

3.9. Improvement in Cooperative and Socialization Skills

Through observations, it was noted that prior to introducing the interdisciplinary curriculum, many students avoided engaging in group work as many of them had immense difficulty working collaboratively. Throughout the unit, numerous opportunities were provided for the students to work in groups. As students worked together to complete a specific task, it became noticeable that their ability to divide the task among themselves. For example, while working on a booklet to solve problems, the group leader allowed each group member to write in the booklet.

Working in groups allowed the students to learn from their peers, especially the ELL students as they verbally communicated with each other. This type of group work provided an avenue for students with social emotional disorders to continue developing their social and emotional skills. For example, an emotionally disturbed student began journaling about his feelings when he was not satisfied with the outcome of an event/activity. When he did play a musical instrument, instead of crying or throwing a tantrum, which was what he did previously, he went into his journal and wrote down how he felt. In a subsequent lessons when he did not get to purchase the fruit he wanted, after the classroom teacher spoke to him for a few minutes, he decided to purchase a different fruit and went to lunch with his journal, where he recorded how he felt. The second author noticed that some of the shy students became more open with their peers during group activities and began to make meaningful contributions to the groups and actively taking part in the activities.

Conducting this action research project allowed the second author who was a student teacher at the time, to get a clearer understanding of the importance of modifying lessons to suit the learning needs and styles of students. Where she once assumed that all students would comprehend at the same rate and in the same manner, she learned the need to be flexible when executing lessons to ensure that all students are acquiring knowledge.

Conclusion

4. TEACHING TO LEARN: A REFLECTIVE EXPLORATION OF THE ACTION RESEARCH PROJECTS

The exemplar action research project illustrates the positive impact teacher candidates' action research projects can have on classroom students' learning. When asked to reflect upon the process the student teacher candidates felt overall that being a student teacher researcher allowed them to: (a) Develop expertise in a specific area as teacher learners while increasing pedagogical knowledge of a specific topic/issue. This led to an increase in pedagogical skills, which has positive effects on teaching and learning; (b) Become reflective practitioners and engage in a process of self-discovery and evaluation; (c) Gain understanding of the importance of teacher efficacy and be more open and flexible to new ideas, which enabled them to make instructional modifications; 4) conduct qualitative research and gain understanding of the complexities of teaching and using investigatory skills and tools to increase students' capacity to learn.

These research projects had a direct and measurable impact on students and student learning. Candidates were excited about the fact that they were prepared as teacher researchers and were actually looking forward to engaging in further research. These findings illustrate the power and potential of action research as an inquiry tool that has positive effects on teaching and learning

By engaging in an action research project the second author was able to learn the importance of modifying her lessons to suit the learning needs and styles of students. When teaching, she saw clearly that she could not assume that all the students would understand what is being taught at the same rate and in the same manner. This process created more flexibility to implement lessons according to individual students' learning styles

Given the opportunity, teacher candidates can be creative and implement lessons that move away from more traditional teaching. For example, in trying to move away from just reading a fairytale to students, the second author discovered that she could adapt the story and rewrite it in the form of a song, as was the case with the *Jack and the Beanstalk*, that catered to the musical learning style of some students in the class.

This interdisciplinary curriculum helped the students acquire additional knowledge, as several teaching strategies were employed such as (a) Direct instruction, which allowed students to receive the necessary information they needed to understand a concept or give information needed to complete a task. It also allowed the second author to use questioning to ensure that students were learning and give them immediate feedback and (b) Cooperative learning, which allowed students to work collaboratively in groups as they engaged in numerous hands-on activities to dissect flowers and seeds, complete a booklet or create a musical piece.

Conducting this action research on an interdisciplinary curriculum was beneficial to the second author and other teacher candidates in the class, the classroom students and the first author who is continuously challenged to make clinical practice meaningful and viable for all involved in the process. The second author felt better prepared to enter the classroom as she gained a wealth of knowledge about both the traditional subject-centered curriculum and the interdisciplinary curriculum.

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