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Moving from Separate Subject to Interdisciplinary [1] Teaching: The Complexity of Change in a Preservice Teacher K-1 Early Field Experience

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This phenomenological inquiry looked at 28 preservice teachers as they participated in a field-based curricula restructuring initiative that connected the disciplines of creative arts, science, and reading. The preservice teachers offered weekly interdisciplinary lessons to kindergarten and first grade students. A survey, teaching cases, and a group exit interview informed the study. Throughout most of the semester, the preservice teachers struggled with procedural and pedagogical content knowledge, concerns directly related to effective teaching. By the end of the semester, they felt comfortable teaching interdisciplinary lessons. Results suggest that preservice teacher curricular restructuring efforts are complex and that teacher educators need to consider the perspectives preservice teachers bring to the change process. Key Words: Curricular Restructuring, Interdisciplinary Lessons, Phenomenological Inquiry, and Teaching Cases

Driven by a search for a new "coherence and integrity in the teacher education curriculum" (Fang & Ashley, 2004, p. 39), scholars now recommend that preservice teachers acquire abilities to organize academic disciplines around broad, interdisciplinary, themed topics of study. An interdisciplinary themed approach has the potential to introduce preservice teachers to a unified constructivist view of learning as they develop understanding of relationships among subjects (Mendolsohn & Baker, 2005). Interdisciplinary teaching also has the potential to foster democratic school changes needed in a multicultural society when students from diverse cultures engage in collaborative inquiry and decision-making (Britzman, 1991; Goodlad, 1984, 2000; National Council of Teachers of English/National Council for the Social Studies/ Council for Elementary Science Teachers Association/ International Reading Association, 2004; Boyer Commission on Educating Undergraduates in the Research University, 2001)

Little research has investigated preservice teacher interdisciplinary programs (Akins & Akerson, 2002; Fang & Ashley, 2004). In particular, few studies have examined the subjective realities of preservice teachers who have been encouraged to move from subject-centered to multidisciplinary pedagogy. Yet, Fullan (1982) cautions that ignoring the phenomenology of how human beings experience and make sense of

[1] There are multiplicities of related terms used in the literature to denote interrelationships among subject areas (Gavelek, Raphael, Biondo, & Wang, 2002). In this article, we use the terms interdisciplinary, multidisciplinary, cross-curricula, and integrated curricula interchangeably.

change is "at the heart of the spectacular lack of success of most social reforms" (p. 4). Guided by a phenomenological research perspective, we investigated the experiences of 28 preservice teachers as they learned to offer theme-based creative arts, science, and reading interdisciplinary lessons to kindergarten and first grade students. We hoped to discover the preservice teachers' subjective realities, including their concerns, achievements, and understandings about interdisciplinary teaching.

What is Interdisciplinary Teaching?

Intermittently popular since the early 1920s, interdisciplinary teaching has once again received favorable attention in the United States as an alternative, or as an extension, to a separate subject curriculum (Akins & Akerson, 2002; Goodlad, 2000; Perkins, 1991). Teachers who emphasize a multidisciplinary approach usually keep the content of each subject intact, but they unite disciplines by organizing the curriculum around complex concepts, questions, themes, problems, or projects to capitalize on connections (Akins & Akerson; Mansilla, Miller, & Gardner, 2000; Ross & Frey, 2002). For example, primary teachers might link social studies, visual arts, and reading to help students explore "the first Thanksgiving." Middle school teachers might connect science, language arts, and the creative arts to stimulate students' understanding about "famous scientists" or "Rain Forest preservation." High school teachers might structure an abstract theme, such as "change" in which students connect the sciences of astronomy and the plant, animal, and physical world with technology, music, and creative and expository writing (Carr, 2003).

Theories Supporting Interdisciplinary Approaches

Several theories of learning support an interdisciplinary approach. New ideas from multiple literacies such as print text, music, the visual arts, and creative and expository writing (Richards & McKenna, 2003), broaden views of learning to encompass all of the diverse ways human beings share information and make sense of their world. Multiple Intelligence (MI) theory describes eight intelligences (linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist) that also provide a foundation for subject integration, by encouraging students to search for meaning and problem-solve across a wide-range of subject areas (Mansilla et al., 2000). Moreover, neuroscientists interested in brain-based research suggest that students learn best when they are fully immersed in an educational experience and can consider multiple views and connections across subjects (Caine & Caine, 1991). Similarly, constructivist theorists believe that education is inherently interdisciplinary and that quality learning only occurs when students and teachers together have opportunities to consider, analyze, interpret, and reflect on big ideas and concepts (Kaufman & Brooks, 1996).

An interdisciplinary curriculum is especially relevant in primary classrooms. Research shows that this approach has the potential to meet the needs of all young students; average, gifted, and those who read below grade level (Gaskins & Guthrie, 1994). Equally important, although current accountability mandates in the United States pressure primary teachers to concentrate on reading and writing instruction, many

teachers have discovered that a multidisciplinary perspective provides time to include content subjects (Ross & Frey, 2002). For example, primary teachers have begun to infuse science into the literacy curriculum. In both disciplines, students set a purpose, analyze, and draw conclusions, and in some school districts science is now a tested primary grade subject (Akerson, 2001; Casteel & Isom, 1994).

The Impetus for Implementing Our Interdisciplinary Preservice Teacher Preparation Model

Typically, during their training, preservice teachers in our Childhood Education Department take separate-subject course work. Integration among disciplines, such as science, creative arts, and reading or social studies and language arts has not been attempted. The Department of Childhood Education offers creative arts and reading courses and the Department of Secondary Education offers science. However, as two supervisors (a professor and a doctoral student) in charge of a creative arts early field experience, we recently made a decision to move from separate-subject to interdisciplinary teaching by connecting the arts with science and reading. The impetus for our decision was fivefold: (1) The elementary school in which our creative arts class operated received a science grant entitled *The Wonderful World of Water*, and it made sense for our preservice teachers to link their arts lessons with the new science curriculum, (2) Many of the preservice teachers in our creative arts class had already completed or were concurrently taking science and reading methods courses. Adding a science and reading component offered opportunities for the preservice teachers to connect three disciplines in an authentic field setting, (3) We wanted to begin to restructure our teacher education program to meet national recommendations that call for preservice teachers to develop abilities to organize academic disciplines around broad topics of study, (4) We saw this as an opportunity for preservice teachers to consider cross-curricula teaching as a way to meet diversity issues in their future classrooms that include, race, culture, first language, and ability differences (Bullock, Park, & Snow, 2002), and (5) We hoped to prepare our preservice teachers for what we anticipate will be a multidisciplinary pedagogy of the future. Our belief mirrors that of Kaufman and Brooks, (1996) who state, "if teachers are to engage in collaborative interdisciplinary endeavors in schools, they must be able to experience and explore such settings in their teacher education programs" (p. 236).

The Context for Our Interdisciplinary Program, the Program Structure, and the Preservice Teachers' Lessons

We offered our interdisciplinary program in a small K-4 charter school located on the campus of a large urban, southeastern university. Charter schools are innovative public schools that offer families opportunities to choose a school most suitable for their children's well being (Center for Educational Reform, 2005). The instructional climate of the charter school where this study took place was student-centered, relaxed, and pleasant. Of approximately 200 students, 80 percent were African American, ten percent were Hispanic, and ten percent were Caucasian. The majority of students came from low

socioeconomic homes, and students' annual standardized reading and language arts test scores fell at or below the 30th percentile.

The 28 preservice teachers (all female, all in their third year of a four-year undergraduate program of study, and between the ages of 20 and 40), convened at the charter school for three hours a morning, each week throughout the semester. As course instructors, we met with the preservice teachers for the first 75-minutes of each class to present multidisciplinary demonstration lessons, provide lectures, and lead seminar discussions. Then, with our guidance and mentoring, the preservice teachers were responsible for offering 75-minute integrated lessons to small groups of approximately three to five kindergarten or first grade students; the same groups throughout the semester. The preservice teachers taught their lessons in students' classrooms or in several adjacent unoccupied school areas, such as the music room, cafeteria, or media center. As supervisors, we continually rotated among the groups to offer suggestions and guidance, and to step in and teach mini lessons when necessary.

Through course assignments, we encouraged the preservice teachers to take every opportunity to link arts, science, and reading with their K-I students. The preservice teachers began their lessons with dialogue journal activities, which were designed to enhance their students' informal writing abilities and to expand students' understanding of science concepts related to the theme of the *Wonderful World of Water*. Then, the preservice teachers and their students participated in a shared book experience with quality children's literature that portrayed dimensions of the school-wide *Wonderful World of Water* science theme (e.g., fiction about such sea animals as whales, turtles, starfish, dolphins, and manatees). The preservice teachers also supported their students' literacy development by offering visual literacy and reading comprehension strategies, such as *What Do I See? What Do I Think? What Do I Wonder?* (Richards & Anderson, 2003b), *How Do You Know?* (Richards & Anderson, 2003a), and a science strategy entitled *What Do You Think? What Do You Want to Know? What Have You Learned?* (Akerson, 2001).

In every lesson, the preservice teachers linked fiction with informational sources (e.g., encyclopedias, Internet websites, diagrams, charts, maps, and photographs of starfish, dolphins, ocean currents, sea turtles, tides, and river trips). They concluded their teaching sessions by collaborating with their students in creative arts engagements that supported the *Wonderful World of Water* theme (e.g., group murals, individual creative books, informal dramatic arts enactments, dioramas, rhythm band activities, vocal music, poetry, dance and movement).

The Inquiry

Rationale for the study

As course instructors, we were enthusiastic about our first integrated curriculum restructuring effort, and we assumed that our preservice teachers would also wholeheartedly embrace this teaching approach. However, early in the semester we recognized that some preservice teachers were unsure about how to connect all three disciplines, and others resisted linking subject matter altogether. It struck us that while scholars note that teacher education restructuring projects are dependent upon the

individuals who experience the restructuring, we had overlooked our preservice teachers as the most important variable in the change process (see Meister & Nolan, 2001). In our top down curriculum change mandate, we had neither asked the preservice teachers for their input nor articulated our understanding about the theoretical underpinnings, goals, and benefits of interdisciplinary teaching initiatives. Equally serious, we had not modeled sufficient interdisciplinary demonstration lessons for the preservice teachers before we required them to teach through a similar approach. In short, we had neglected to consider how the preservice teachers might experience the change as they moved from a subject-centered curriculum to a multidisciplinary curriculum.

Mindful of Hargreaves' (1994) cautionary observation that change facilitators must understand the perspectives that teachers bring to the change process, in terms of their conceptions of time, power, and the emotional aspects of teaching, we conducted the following inquiry. We wanted to understand our preservice teachers' individual and group experiences, and the meanings they attached to their experiences as they learned to offer interdisciplinary lessons. We also hoped to add pragmatic information to the limited research base regarding integrated preservice teacher education programs. Ultimately, we sought to enhance our own practices by fine-tuning the content and structure of the program, to meet preservice teachers' individual and collective needs in future curricular restructuring initiatives.

After receiving Internal Review Board (IRB) approval from the Office of Grants and Contracts at the University of South Florida and obtaining signed study participation Consent Forms from the preservice teachers, we conducted the following inquiry guided by the following four questions:

1. What concerns and achievements did the preservice teachers experience as they learned to offer interdisciplinary lessons to K-1 students?
2. How did the preservice teachers understand and describe their experiences?
3. Did the preservice teachers' subjective realities about interdisciplinary teaching change over the course of the semester?
4. Did the preservice teachers develop an understanding about how to plan and offer an interdisciplinary curriculum?

The Conceptual Frameworks for Our Inquiry

A phenomenological interpretive framework grounded our inquiry. The goal of phenomenological studies is to capture commonalities associated with the shared meanings and perceived realities of a group of people in a specific context by systematically examining their "experiences in close detailed ways" (de Marrais & Lapan, 2004, p. 56). Phenomenological methods explore "how human beings make sense of experience – how they perceive it, describe it, feel about it, judge it, remember it, make sense of it, and talk about it with others" (Patton, 2002, p. 104). Through interviews, observation, and language analysis, phenomenologists attempt to enter the conceptual world of study participants in order to "understand it as they do, and to portray that understanding" (Meister & Nolan, 2001, p. 610).

We also viewed our inquiry as a holistic context-specific, intrinsic case study involving a group of individuals who experienced a phenomenon. Case studies analyze

critical incidents or stages that can be defined as a specific and unique bounded system (Stake, 2005; Also see Fals Borda, 1998).

Data Sources and Analysis

We employed three types of qualitative data collection strategies to inform the inquiry. The preservice teachers (a) responded to a mid-semester survey (see Appendix A), (b) authored an end-of-semester teaching case that portrayed their concerns and problems associated with interdisciplinary lessons, and (c) participated in a recorded group exit interview that was later transcribed. These three sources along with our observation notes of the preservice teachers' lessons proved helpful in our attempt to understand the meanings the preservice teachers attached to their experiences as they learned to integrate instruction.

In addition, the three multimodal data sets coupled with our field notes allowed us to study the same phenomenon through different lenses, which provided opportunities for triangulation, a method of corroborating evidence from different sources, "a means of reducing ambiguity and the likelihood of misinterpretation, and a process of using multiple perceptions to clarify meaning" (Stake, 2000, p. 443; Also see Anfara, Brown, & Mangione, 2002; Fang & Ashley, 2004 for a discussion of internal validity verification procedures in qualitative research). As an additional check on our assumptions, throughout the semester we presented our summary of the data to the preservice teachers and noted their responses regarding the accuracy of our constructions (Denzin & Lincoln, 2005). All of the preservice teachers confirmed that we represented their views appropriately.

Viewing the three main data sets chronologically seemed most appropriate as a means of providing a systematic review of possible changes over time in the preservice teachers' challenges, achievements, and subjective realities regarding interdisciplinary teaching. Therefore, we ordered the data according to points in time, beginning with the preservice teachers' responses to the mid-semester survey and ending with the transcriptions of the structured group interview.

We began our examination of the data by conducting a careful "line-by-line reading of the text[s]" (Ryan & Bernard, 2000, p. 780). We read and reread the preservice teachers' language and jotted down our assumptions when we believed that certain phrases, sentences, and paragraphs, defined by Hycner (1985) as "units of general meaning" (p. 145), illuminated the preservice teachers' realities. For example, we highlighted individual preservice teachers' responses such as, "So what is my problem? My problem is time." "The first stage involved modeling my own self-created book and discussing the three disciplines of creative arts, reading, and science employed in its creation." "This entire experience has been rough." "Science was mainly left out of my instruction." "It got easier as time went along. Most elementary schools don't even get to science." "I cannot seem to structure my teaching time." "I cannot teach a group of kindergarten students who do not pay attention. I may change majors. I might not be a teacher after all."

Then, we jotted down broad impressions that we believed typified the preservice teachers' perceptions of their experiences such as, "rough time, especially at the beginning of the semester," "easier as time went along," and "left out science." Through

this process we identified seven topic clusters of meaning. Our next step was to review each of the topic clusters to ensure that they expressed a unified coherency that helped to support our research questions.

Subsequently, following Hycner's (1985) guidelines for in-depth phenomenological analysis, we crystallized and grouped the seven clusters of meaning under two overarching themes, which we labeled *Uncertainty, Stress, and Doubt* (four clusters fell under this first theme), and *Positive Viewpoints, Understanding, and Confidence* (three clusters fell under this second theme). This recursive process helped provide us with a sense of the gestalt the preservice teachers attached to the phenomenon of participating in the field-based curriculum restructuring initiative.

Limitations of the Inquiry

Several limitations of the inquiry must be considered before we address the preservice teachers' perceived realities, share our understandings of lessons learned, and discuss the next steps for our future interdisciplinary preservice teacher restructuring initiatives. We acknowledge that our assumptions cannot be generalized to other preservice teacher programs. This study investigated 28 preservice teachers' lived experiences in a specific school context, and to a great extent school contextual influences determine preservice teachers' subjective realities (Richards, Moore, & Gipe, 1996/1997).

We must also note that teachers who author teaching cases consciously identify and write about pedagogical problems rather than teaching successes (Richards & McKenna, 2003). Therefore, although we placed no restrictions on the preservice teachers' responses to the survey and group interview responses, we directed them to author a teaching case that portrayed a problem or predicament they encountered as they taught interdisciplinary lessons. Their achievements were not included in their case writing. Despite these limitations, we included cases to inform our study because we recognize that they illuminate the context in which teaching occurs (Richards & McKenna).

Researcher subjectivity is another central consideration in qualitative research. Scholars note the difficulty of separating the researchers from the researched (Alvermann, 2000; Noddings, 1984; Peshkin, 1983). Our previous teaching experiences and our dual roles as researchers and supervisors, of a newly organized preservice teacher interdisciplinary program, influenced how we identified units of general meaning, grouped the units of general meaning into clusters, and how we determined and titled the two overarching themes. Others might draw different conclusions from ours (see Tappan & Brown, 1992 for a discussion of hermeneutics).

A further concern is "the potential limitations of self reported data" (Shavelson, Webb, & Burnstein, 1986, p. 44). From a phenomenological perspective, the preservice teachers' language provided the best view of the meanings they attached to their experiences. However, the inquiry was dependent on their willingness and abilities to describe their realities and reveal their "true" selves. With these limitations in mind, we make the data visible by presenting the preservice teachers' lived experiences in the following section.

The Preservice Teachers' Lived Experiences

Theme One: Uncertainty, Stress, and Doubt

For most of the semester, the preservice teachers struggled with two procedural concerns associated with effective teaching practices: (1) time management and (2) group supervision. They also grappled with two pedagogical content knowledge issues[2] directly related to the program: (1) subject matter integration and (2) preparing and presenting creative arts lessons. We present the preservice teachers' dilemmas in the following section.

Time management concerns

The preservice teachers struggled with time management issues in two ways. Early in the semester, some completed their instructional sessions with time to spare because they had not thoroughly planned and prepared their lessons. A preservice teacher explains her under planning predicament in the following teaching case excerpt:

> By the time my students finished their drawings I had more than 20 minutes left in my lesson. Twenty minutes is a long time. I did not know what to do next. I didn't want to seem unorganized but I could not believe that what I had planned only took such a short time. What was I to do? The students were getting bored and they saw other groups making dioramas, painting, and still reading books. I had to think of something quickly. I got out some paper and said, "You can draw anything you like." (I know that is not good teaching).
>
> I learned from this lesson to slow down. Maybe I talk too fast. I tend to rush through things. I also know I should have done more planning. To be honest, I've got to admit that's the real reason my lesson ended abruptly – never mind talking too fast. I could have had more informational material. I did not do a during-reading strategy. I now know it is better to over plan. We could have done some ocean songs, or games to use up the time. That does not sound good either when I say, "Use up the time." It sounds like I am trying to just finish up the lesson and get out of there.

For the most part, however, the preservice teachers believed they did not have enough time to offer a three-subject lesson in 75 minutes. One preservice teacher confided to us, "I can't seem to pace myself."

Others wrote comparable comments on the mid-semester survey such as, "I do not have enough time." "I can get to creative arts and reading but not science – no time." "Forget science – there is no time." "Does anyone notice how stressed I am about time? I have no time." "I don't like cutting my students off when they are making good

[2] Pedagogical content knowledge "requires that teachers understand and interpret the subject matter they plan to include, [and] find ways to represent this knowledge for their students" (Gavelek et al., 2002, p. 600).

connections among subjects, but time runs out." "I still feel I am cutting them short on their learning because I have to stop them because I run out of time." "I do not know how long a section of a lesson takes because I have never done this before." "My only dilemma is the short amount of time. How do I relate the arts, science, and reading when I always run out of time? And I am not sure anyway how to tie it all together."

Supervising groups of students

Clearly, a well-defined reality for the preservice teachers was the stress they experienced as they learned to manage groups of students. Excerpts from three of the preservice teachers' teaching cases highlight their management concerns.

Pay Attention, Please!

> I have a suggestion for other preservice teachers. Listen to me. Read my lips. Trust me. Don't take this course with other difficult courses. It is hard to make kids pay attention all the time and it zaps my energy. Every Thursday morning I work with three kindergarten students for an hour and 15 minutes. One student, Jordan, just will not behave at all and the other two students are hardly any better. I have decided I will make this group listen and pay attention if it kills me! Sometimes, Jordan rolls his eyes at me and says, "I am not doing this any more."
>
> Then, the other students act up because they see Jordan getting away with inappropriate behavior. I have tried. I really have. I talk to them. I use positive behavior rewards, such as stickers. I sit next to Jordan. I put kids out of the group for five minutes. I even brought in some clay. I am a failure at group management. How will I make 30 kids behave all day when I have my own class?

How Can They Learn If They Don't Listen?

> Last week nothing went right. I'd been prepared since Day One, but I did not expect what happened. From the start the kids wouldn't listen so how can you teach a lesson if they don't listen and hear you? I separated them when one little girl tried to stab another girl with a pencil and then she hit a boy. One boy was disrespectful and another boy must have a physical problem because he has to go to the bathroom all the time (Maybe he just wants to disrupt the group). This is my worst nightmare. I cannot teach because my students will not listen to me.

Marching to the Beat of a Different Drum

> My brightest student, Billy, is my biggest behavior problem. When I got to school today, his teacher had already put him out in a separate corner for disrupting the class. Because we were reading about a boy who visits his

> grandparents on a Caribbean island, I began my lesson by using some literature and pictures about Jamaica that I found on the Internet. I also showed my group a steel drum I bought in Jamaica. In addition, I had a map of the Caribbean area, and I told the students how the steel drum was actually invented in Trinidad. I let each student play the drum. This went well until it was Billy's turn. He beat furiously on the drum, and he refused to pass it to another student. Well, I took the drum away from Billy and with that, he grabbed the drumsticks from another student and began to beat the drum again. I said, "Class, if you cannot share and be respectful of my drum, then we will not use it." The students said, "That's not fair. It's all Billy's fault. He's always bad." Billy responded, "I don't care what you say. I am the best drum player and I am going to play." We tried again. I helped the students beat the drum and clap their hands to some sea chants. Billy just sat there with a mad face. I used a chart of sea chants next and the students were unable to clap their hands or beat the drum in time to the rhythm of our chants. Do you think I should have not tried to incorporate music? These kids are hard for me to handle. I know this is more of a behavior case than a teaching case, but I had to write about this dilemma.

Teaching through an interdisciplinary approach

There is no doubt that throughout much of the semester the preservice teachers had difficulties weaving the subjects of creative arts, science, and reading into a cohesive framework. As one preservice teacher wrote, "It's exhausting. It's too much putting all of this together."

A passage from another preservice teacher's case highlights her dilemma about connecting disciplines.

Science was the Last Thing on My Mind

> I've been able to integrate creative arts and reading easily. It's when I try to also integrate science that I hit a roadblock. I'm unsure how to tie all three things together and keep it interesting for the students. The bottom line is - I do lots of art. I just can't connect three subjects. It has been very difficult for me to integrate science into all of my lessons. Truthfully, science was the last thing on my mind.

The preservice teachers gave similar responses about connecting subjects on the mid-semester survey. Some wrote, "I haven't really connected all three subjects. I just can't get it all together." "Science is factual. Art is creative. Literacy is language. There are differences among these three subjects. So, I have problems seeing connections. I am starting to doubt my teaching skills." "I have connected science to music. That's about it – not very good is it?" "Science = facts. Literature = reading. Creative arts = creativity. Don't ask me how to connect them. The one common thing about all three subjects is they need to be taught."

> How do classroom teachers do this type of teaching? I assume they can do it because they have the kids all day. Another thing is that I always had to study separate subjects when I was in elementary school so this is all new to me. I have no experience with it.

Preparing and presenting creative arts lessons

Despite the fact that our restructuring initiative was centered around a required creative arts course, preparing and presenting weekly arts lessons that were linked to science and reading, revolving around the topic of the wonderful world of water remained problematic for all of the preservice teachers. Even though we tried to assuage their doubts, the preservice teachers continued to voice their reservations about their artistic abilities throughout the semester. The following excerpts from the mid semester survey and the end-of-year exit interview portray their concerns and worries about their self-perceived lack of creativity and their quandaries about offering their students appropriate and worthwhile engagements in the arts. "Creative arts were hardest – trying to figure out what to do each week." "It is not easy to be creative all the time." "I am not an artist, I cannot sing, paint, or dance." "I am just not a creative person. I do not like to sing at all and I cannot draw." "Coming up with creative ideas each week made me worry from one week to the next." "Some people are creative. Some are not. I am not. I am stressed out all the time about my inability to plan creative arts lessons." "I simply am not artsy. I never will be an artsy type teacher. I don't have the skill – the talent." "You told us we could not use coloring books and ditto sheets for kids to color in. That left me up a creek so I just tried to ignore the arts." "The arts are so difficult for me. All I ever did in school was color with crayons. This creative arts emphasis is demanding. Can't you tell us what to do? Must we sing, dance, and do drama?" "I really try to offer arts lessons that are meaningful and valuable. I don't think I am on the right track."

Theme Two: Positive Viewpoints, Understanding, and Confidence

By the end of the semester, the preservice teachers acquired more positive viewpoints about their teaching experiences. They appreciated the benefits of participating in an early field experience. They also recognized the value of subject integration and developed confidence in their abilities to teach through an integrated approach. We present these positive changes in the preservice teachers' perspectives in the following section.

Appreciating the benefits of participating in an early field experience

In the end-of-semester exit interview, the preservice teachers mentioned the professional knowledge they acquired by participating in an early field program. They remarked about the value of working with kindergarten and first grade students, and spoke about the opportunities offered for collaborative interactions with teaching peers and classroom teachers. The preservice teachers explained in the end-of-semester interview,

> I came to like the field experience. It is one thing to get an 'A' in the university classroom, but what about the interactions with K-1 students? Where can you learn that? Only in a field experience could you learn that!

"We could collaborate, learn from each other, and borrow ideas and teaching supplies from each other." "At first I was nervous and worried because I have never participated in a field-based course. I was actually afraid to teach k-1 and that is crazy because I am studying to be a teacher."

> Whooo – This was a lot of work. All that preparation - getting teaching supplies – being on time to teach kindergarten and first grade students – not being absent. But, it was worth it. I learned a lot. I feel prepared to teach. I am proud of myself.

> This was an eye opener. I would recommend it to anyone who wants to work hard and learn to teach. It wasn't easy. It was hard work. But then, I learned so much teaching K-1 students. Now I know what I am doing.

"I actually feel sorry for my soon-to-be teacher friends who have never participated in an early field experience." "We could communicate with our classroom teachers and learn from them." "I can't even say how much I've learned. It was hard-very hard – but well worth it." "I am now ready to teach after this experience."

Recognizing the value of subject integration

To our surprise by the end of the semester, the preservice teachers came to recognize the value of subject integration as a teaching philosophy and method. Their comments in the exit interview indicated that they understood theory that supports an interdisciplinary approach, and they connected subject integration to students' learning. "All three disciplines encourage exploration!! I get it now." "Teachers can use one subject to teach the other two. It doesn't matter which subject you use. It is easy now."

> Students who struggle with learning really get a chance to achieve when teachers connect subjects. I noticed this, the more I taught my lessons. One struggling student even authored the best creative book out of all my students in the group. He wrote about grey whales and his illustrations were fantastic.

"All good teaching expands students' inquiry and knowledge and that is especially true of interdisciplinary teaching." "I am going to connect subjects as much as possible when I am a teacher. The kids love to learn that way because they can see connections." "I now believe that all primary teachers need to offer this type of approach. There is no other way. As human beings we make connections all the time. That's the way we learn." "Interdisciplinary teaching is not only possible – it is the way to teach."

> Literacy events are creative. Use literacy to learn about science. Represent science through the creative arts. There you go – it's like a full circle. One subject can be used to learn about another subject. The creative arts can help students show what they have learned about another subject. In addition, all three subjects - creative arts, reading, and science have similarities, like exploration and discovery – like predictions and conclusions.

Confidence in abilities to teach through an interdisciplinary approach

Despite their initial reservations about planning and presenting interdisciplinary lessons, by the semester's end, all of the preservice teachers gained confidence in their abilities to link subject matter. Their exit interview comments resonated with self-assurance. "It became a confidence booster to recognize I could integrate disciplines and my friends in other courses could not. In fact, they didn't know what I was talking about. Of course that isn't nice of me to gloat."

> I wasn't sure at first how to do it but then it was okay. I could actually do it and understand why this type of teaching and learning is so important. Science was the easiest for me because I could look up stuff.

"It's easy to integrate now. Many schools don't even get to science. When I'm a teacher I can offer science lessons even if we have to teach reading all day." "It's easy to integrate science and reading. I have new found confidence in me." "I wasn't sure at first how to connect all three disciplines, but as time went on, then it became better." "Yes, now I know it can be done. All subjects are all interconnected."

> I have connected it all and I am proud of myself. I never thought I could do that until the end of the semester. The students' journals are now filled with words, pictures, and sentences about science. They read about science concepts. They did creative arts activities that integrated science.

"I can use this approach now."

Lessons Learned

Certainly, the results of our inquiry pinpoint some achievements and success. By the end of the semester the preservice teachers developed considerable insights about the benefits of participating in an early field program. They also recognized how different subjects can support one another in areas commonly shared, and how subject integration has the potential to enhance students' learning.

Yet, just as the literature indicates, our first preservice teacher curricular restructuring effort turned out to be far more demanding and complex than we had anticipated. The language the preservice teachers used to describe a large part of their teaching experiences poignantly illuminates the challenges they faced with procedural teaching concerns of time management and student supervision. They also grappled with

pedagogical content knowledge dilemmas directly related to subject integration, and worried about planning and offering meaningful creative arts lessons that supported students' learning in the disciplines of science and reading.

Research indicates that it is common for preservice teachers to overlook time management and planning as important variables in effective teaching (Moore, 2003), and that supervising students is a key concern of beginning teachers (Fuller, 1969; Moore). A few studies also suggest that most preservice teachers have reservations about their abilities to design appropriate and imaginative student engagements in the creative arts (Gipe, Richards, & Moore, 2001; Halliwell, 1993; Richards, 2005). In addition, a small body of research indicates that preservice teachers who are required to offer an interdisciplinary curriculum initially experience tensions about their abilities to connect subjects and lack appreciation for subject integration (Young, 1991/1992).

However, research findings that parallel the preservice teachers' experiences in this inquiry do not excuse the significant role we, as supervisors, played in exacerbating their uncertainties and doubts. Although the field experience offered opportunities for creating new knowledge among our preservice teachers, we now know that we expected them to move too quickly from separate-subject to interdisciplinary teaching. Our desires to prepare our preservice teachers for what we believe will be a multidisciplinary pedagogy of the future, although well-meaning, took precedence over meticulous planning, coordination of activities, and reflection on the content base of our program, including our intentions and the goals of our restructuring initiative. Equally serious, we did not heed Hargreaves' (1994) cautionary observation that change facilitators must understand the perspectives that teachers bring to the change process in terms of their conceptions of time, power, and the emotional aspects of teaching.

Final Reflections: Looking Back / Looking Forward

Looking back, we can see that over the course of the semester we learned a lot about the complexities of educational change. We now have a clearer understanding about what it takes to engage in a successful preservice teacher restructuring initiative. Our next agenda needs to begin with a thorough examination and articulation of our own knowledge, beliefs, and perspectives about interdisciplinary teaching. We need to clarify our own uncertainties and dispel any ambiguities we hold about the underlying theoretical foundations of an integrated curriculum before we can fully inform and support our preservice teachers as they strive to make connections across disciplines. This support particularly includes helping our preservice teachers examine and reflect on the theoretical underpinnings of multidisciplinary teaching. It is unacceptable to ask our preservice teachers to adopt interdisciplinary methods if they are not familiar with the key tenets that support these methods.

It is also essential that we include our preservice teachers in future curricular restructuring planning sessions, so that they have opportunities to develop some ownership of the teaching perspectives we want them to consider and understand the approach we encourage them to implement. For example, we plan to ask our preservice teachers to participate in designing some of the program's activities. They might also collaborate with their K-1 students and select individual small group encompassing

themes of study based upon their students' interests rather than respond to our mandated topic of study.

We also need to ensure that our preservice teachers have the prerequisite procedural and pedagogical knowledge base to make a successful transition from a separate-subject to a multidisciplinary approach. Offering a multidisciplinary curriculum requires multiple levels of planning and sufficient subject matter knowledge as well as an understanding about how to represent and adopt that knowledge for students' levels of development. Relevant course readings, class discussions, and guest speakers in the visual and performing arts are some of the ways we can provide a clearer direction for our preservice teachers as they strive toward change implementation.

Unquestionably, we need to address course scheduling. We need to enlist support from our college administrators and arrange an integrated, contiguous block of field-based courses that might be offered two mornings a week rather than trying to squeeze two or three subjects into a one three-hour semester course. This schedule configuration would also allow for broader faculty collaboration in which two or three elementary and secondary faculty members work together (e.g., reading and science, or mathematics, language arts, and creative arts courses).

Most importantly, we need to consider the perspectives our preservice teachers bring to the change process as they move from a subject-centered to an interdisciplinary curriculum. As teacher educators, we need to learn to see through our preservice teachers' eyes and recognize that it is unethical and unreasonable for us to teach and expect "great ideas" unless we help our preservice teachers "understand how to [think about] and execute those great ideas" (Stephens, 1998, p. 377).

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Appendix A

Preservice Teacher Mid-Semester Survey-Interdisciplinary Project

Dear Preservice Teachers,

We want to know about your experiences in this interdisciplinary project. We will use the information you provide us to help structure future curricula change initiatives in our College of Education. You have already signed an Internal Review Board (IRB) Consent Form that indicates your willingness to participate in this research project. However, your participation in this survey is voluntary. It will NOT affect your final grade if you choose not to complete the survey. Thank you for your help.

Dr. Richards, Course Instructor and Kim Shea, Doctoral Student

Please use the back of this paper to continue writing your thoughts.

1. What do you think the subjects of creative arts, reading, and science have in common?
2. In what ways have you connected creative arts, reading, and science in your lessons at the Charter School? (e.g., dialogue journals? children's literature? arts projects, including music, visual art, drama? creative books? murals?)
3. What were your toughest moments teaching through an interdisciplinary approach?
4. What still puzzles you about an interdisciplinary curriculum?
5. What will you tell others about your experiences planning and teaching interdisciplinary lessons?
6. What positive experiences did you have that centered on teaching through an interdisciplinary approach?

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