THE ATTITUDES AND BELIEFS OF PRE-SERVICE ELEMENTARY EDUCATION TEACHERS TOWARD THE INTEGRATION OF SOCIAL STUDIES AND SCIENCE CURRICULA

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I

INTRODUCTION

"A current trend in schools has been the promotion of interdisciplinary curricula" (Richburg & Nelson, 1997, p. 85). Interdisciplinary or integrated curricula, is designed to increase student learning and retention of material (Beane, 1997). An integrated curriculum is a curriculum that combines two or more subject areas to create one course or cover an educational theme. For example, a middle school unit on flight, combining the history of flight with the physics principles of flight, represents an integrated unit that combines social studies and science.

Schools are willing to switch from the traditional model of education, with separate subject area courses, to an integrated one in which several subject areas are taught in a single course for several reasons. A result of an integrated curriculum is that it can help teachers keep their students engaged in the classroom. Also, lessons can be adjusted to meet the many different learning styles of students. These results of integration were researched by educator A. Dykman. In her report on integrated lessons, students excelled, including "the very kids who didn't have the basics" (Dykman, 1997, p. 25). These kids were the students who had never previously excelled in classrooms because of various reasons. She states that the integrated lessons were very successful

because "the kids were so involved that they couldn't help but learn" (Dykman,1997, p.25).

The flexibility of integrated curricula was addressed by one school administrator when he stated "give the teachers the freedom to experiment and don't get upset if something doesn't work" (anonymous, 1997, p.23). This flexibility allows teachers to adjust their integrated lessons to continue with what works or change what does not. It also allows them to be able to adjust the integrated lessons for all students' learning styles. This freedom could lead to a greater chance of students becoming involved in the lessons and therefore learning more from the integrated lessons.

One researcher states that students can gain more knowledge with integrated lessons than with the traditional model of lessons. This would be another factor for using and studying an integrated curricula.

> When the integration of knowledge is advocated in schools, it is usually argued that it makes knowledge more accessible or more meaningful by bringing it out of separate subject compartments and placing it in contexts that will supposedly make more sense to young people. As we have already seen, a growing body of research evidence suggests that such 'contextualizing' of knowledge does make it more accessible (Beane, 1997, p. 7).

RATIONALE FOR COMBINING SOCIAL STUDIES AND SCIENCE

With more and more independent research showing the advantages of integration, many professional education organizations have also declared a need for an integrated curriculum in schools. Specifically, this declared need has created a demand for the teaching of social studies and science in integrated classes. The national standards documents of many learned societies such as the National Council for the Social Studies (NCSS) and the National Science Teachers Association (NSTA) call for curriculum integration. These calls for integration could cause a shift away from the traditional, separate way subject areas have been taught and should be reflected in the education of future teachers. Science educator Dirk Oden provides a rationale for the integration of social studies and science by stating

> the more we can learn about the past, the better we can understand our world today. This universal idea has a specific importance in science teaching, as reflected in state and national science standards. No quality science curriculum ignores the history of life on Earth (Oden, 1998, p. 38).

In both social studies and science, the national standards were established to actively encourage integration of subject areas. According to the social studies national standards established by the NCSS, "social studies programs should include experiences that provide for the study of relationships among science, technology, and society" (NCSS, 1994, p. 12). This statement demonstrates that the National Council for the Social Studies has a serious commitment to the combining of curricula. The national

standards provide the guidelines for teachers in the fields of social studies to follow. These guidelines represent a set of standards that are designed to be in the learner's best interest. The guidelines are flexible as the NCSS reviews them to reflect current trends in research and changes in priorities.

The National Science Teachers Association (NSTA) also advocates curriculum integration. The National Academy of Sciences (NAS) is the organization that established the national standards that are followed by the NSTA. Any information included in these standards, such as the call for curriculum integration, is designed to recommend the best ways for students to learn science. In the science standards established by the NAS, it is stated that science teachers must "work together as colleagues within and across disciplines and grade levels" (NAS, 1994, p. 30). This implies that the NSTA, by suggesting that science teachers work together with teachers from other disciplines, is in favor of curriculum integration.

STATEMENT OF THE PROBLEM

While social studies and science have been taught traditionally as individual subjects, a recent push has been made by professional societies to begin teaching these two subjects as an integrated curriculum. At the core of the reform movement is the belief that integrated curriculum has many advantages. Numerous schools, especially middle and elementary schools, are moving toward integrated curricula, specifically combining social studies and science. In teacher education, however, most colleges and

universities still teach social studies and science in separate methods classes and offer no type of integration.

PURPOSE OF THE STUDY

The purpose of this study is to analyze the attitudes and beliefs of pre-service elementary social studies and science teachers toward the integration of social studies and science. The study will compare the attitudes and beliefs of a group of students enrolled in an integrated elementary social studies and science methods course with the attitudes and beliefs of students from separate elementary social studies and science methods courses. All of the pre-service elementary teachers attended the same university. This research will try to analyze the attitudes and beliefs of pre-service elementary teachers toward the integration of these two subjects. The research will be conducted both before and after the completion of their respective social studies and science methods courses.

DEFINITON OF THE TERMS

The following definition of the terms is furnished to provide, as nearly as possible, clear and concise meanings of the terms as they are used in this study.

Pre-service Teacher: Pre-service teachers are students at a university completing the requirements for graduation with a degree in education and certification to teach

at the elementary level. They have not completed their student teaching assignment, which is the final graduation requirement for a degree in education.

Integrated Curriculum: Integrated curriculum refers to the combining of two or more subject areas, those that are traditionally taught in separate courses, into one unified course.

Cross Curricula: Cross curricula, or crossing curricula, refers to the integration of two or more subject areas that are combined, or crossed, into one unified course.

Interdisciplinary Curriculum: Interdisciplinary curriculum refers to two or more independent curricula that are combined to create one unified course.

Teacher Education: Teacher education is the university process and required coursework that pre-service teachers must complete before becoming a fully degreed and certified teacher.

Elementary Education: Elementary education is the university process specific to elementary education (K – 8) that pre-service teachers must complete to become a fully degreed and certified teacher.

Control Group: The control groups in this study were the two groups of pre-service teachers that were enrolled in the traditional science and social studies methods courses. These groups received the standard and traditional educational background with no coursework in integrated subject areas.

Experimental Group: The experimental group in this study was the group of pre-service teachers that was enrolled in the integrated science and social studies methods course. This experimental group received a non-traditional education that included an experimental course in teaching integrated subject areas.

SIGNIFICANCE OF THE STUDY

This study can help analyze the feasibility of curriculum integration at the elementary level. The information can provide insight into the attitudes and beliefs of future teachers who will be expected to implement the integration of these subjects into elementary classrooms. Professional educators can use this research to determine the feasibility of integrated methods courses in the subject areas of social studies and science. The information gathered can also be used to adjust future curriculum integration programs by exploring the attitudes of students toward integrating social studies and science after the completion of the courses. Professionals in the field might use this information to encourage future teachers to pursue the integration of social studies and science.

ASSUMPTIONS

The assumptions of this study include the idea that the integrated approach to teaching these subjects will affect the attitudes and beliefs of the students enrolled in the methods classes. An additional assumption is that all students will have no experience or background in integrated curricula when they enter these classes. A third assumption is that students in the integrated science and social studies classes will have a more favorable attitude toward the integrating of curricula in schools than the students enrolled in the separate subject area methods courses.

LIMITATIONS

A limitation in this study is that the teachers conducting the separate science or social studies methods classes are the same individual teachers who are going to cooperatively teach the integrated science and social studies courses. The classes are being conducted with independent curricula and syllabi, but the teachers' beliefs about integrated curriculum could affect the attitudes of students enrolled in the separate subject area methods courses.

ORGANIZATION OF THE STUDY

The participants in this study are all pre-service elementary education students. They were divided into three different methods courses. One group of the pre-service teachers was enrolled in an elementary science methods course. Another group of the pre-service teachers was enrolled in an elementary social studies methods course. The remaining group of pre-service teachers was enrolled in an integrated social studies and science methods course. At the beginning of the semester all participants were given a survey (pre-test) over their attitudes and beliefs about integrating the fields of social studies and science. After the completion of their respective courses, all participants completed the same survey (post-test). Data analysis should allow the researcher to evaluate the differences in attitudes and beliefs of the control groups and the experimental group.

II

REVIEW OF THE LITERATURE

INTRODUCTION

The purpose of this review is to document relevant information and previous research relating to curriculum integration. The first section will establish a working definition of the term 'integrated curriculum' for the context of this paper. Several examples of integrated social studies and science curriculum will be given that are already being employed in local elementary schools. Rationale for an integrated curriculum will follow. Establishing the importance of an integrated curriculum will be the fourth section. Because of the calls for integration from national organizations like the NCSS and the NSTA, the importance of properly preparing pre-service teachers to be able to use integrated approaches to teaching will be established.

What is integrated curriculum?

Integrated curriculum is a model that minimizes instruction in isolated academic disciplines by combining goals and objectives from a variety of areas. "Teachers using integrated curriculum may select a subject for instruction and include related topics from other areas in the unit plan" (Reisberg, 1998, p. 272).

An integrated curriculum helps teachers to cross disciplines or combine disciplines within their classrooms. A teacher or team of teachers can take subjects that have been traditionally taught as separate areas and change them to be taught in one course. These teachers could also combine the two or more courses to cover the same theme. An example of this occurs when social studies and science teachers plan a unit together. This aligning of their lessons will allow students many chances to learn about the single topic because it is being taught from different perspectives in different classrooms.

> Integration refers to combining two or more disciplines into a single curriculum. Social studies is ideal for integrating a curriculum because not only do its six strands interact naturally and easily, but it can serve as a focus for nearly every other subject taught in the elementary/middle school (Young, 1994, p. 20).

Integration occurs when two or more subject areas are joined, based on logical connections, in a instructional setting. Social studies and science are subject areas that naturally combine in this way. Any time a social studies and science teacher plan a unit involving the same topic to be taught in both classes simultaneously, such as a physical geography lesson, it is integrating curriculum.

Examples of integrated curriculum

Social studies and science are subject areas that can be easily combined in an integrated class. Social studies can be combined with many different subject areas because it involves wide-ranging subjects such as history, economics, government and geography. Science, in turn, has a natural connection with social studies. Because of areas such as physical geography, earth science, geology, ecology and environmental

science, which can be studied as either a social studies or science subject area. Several examples of the combining of the subjects of science and social studies have been researched and discussed in educational journals.

The article "A Blast from the Past" by science educator Ken Sharp discusses a school project that involves the integration of science and social studies. The first section of the paper, entitled "Ancient History" (Sharp, 1998, p. 32), establishes the necessity of integrating science and social studies for the project. In this section the students research the history of the earth. The students are to gain the required background knowledge from both the fields of social studies and science. Without understanding the historical, geological, and geographical information that this initial research uncovers, the students would not be able to successfully complete the project. Without the integration of science and social studies school projects such as this one are not possible.

Another article that discusses the integration of curricula is "The high school geography project: A retrospective view" by Nicholas Helburn. It describes a project from a social studies viewpoint while addressing "scientific respectability" (Helburn, 1998, pg. 212). Demonstrating the importance of combining social studies and science when teaching geography, this article addresses how many geography teachers "were trying to teach geographic skills without the necessary factual foundation" (Helburn, 1998, p. 216). In essence the author was stating that geography could not be taught correctly in a social studies course without addressing the scientific basis of the subject. Because "education is an enormously complex system with many vested interests" (Helburn, 1998, p. 218), all of these interests must be met. Integrating the curricula is a way to satisfy these vested interests.

"Constructing a Prehistoric Adventure," a project that has been implemented in Dirk Oden's school, also combines science and social studies. It is a science project that has the students researching the extinction of dinosaurs. "Students work together in teacher-assigned groups of two or three to research, design, and build a display about one of the geologic time periods or about a topic related to the history of life on Earth" (Oden, 1998, p. 39). The students must use their combined knowledge of history and geology to complete the project. The two fields are combined so they are dependent on one another. According to the author, this successful project lasted for several years. It could not have existed without the integration of science and social studies.

Why do we need to study integrated curriculum?

The calls that have gone out from various respected national education organizations provide a major reason for studying the possibilities of an integrated curriculum. The NCSS has a set of standards that are designed for social studies teachers to improve the education of their students. The National Social Studies Standards, developed by the NCSS, are to be guidelines for social studies teachers to determine what kind of curricular information to use in their classrooms.

In the NCSS national standards there is a call for integrating curricula. The NCSS standards state that "social studies programs should include experiences that provide for the study of the relationships among science, technology and society" (NCSS, 1994, p. 43). Also in the NCSS national standards is a call for social studies programs to "identify and describe both current and historical examples of the interaction and interdependence of science, technology, and society in a variety of cultural settings" (NCSS, 1994, p.

132). Both of these quotes taken from the NCSS national standards demonstrate that this national organization is in favor of some form of curriculum integration.

The NSTA serves as the leading national organization for science teachers in American schools. The NSTA has also issued a desire for the combining of curricula. The National Academy of Sciences (NAS) is the organization that establishes the science standards that the NSTA follows. This organization has expressed the need for integrated curriculums in its standards. The NSTA standards state that science students should be able to "use history to elaborate various aspects of scientific inquiry, the nature of science, and science in different historical and cultural perspectives" (NAS, 1996, p. 200). This is a direct call for integration of curriculum that will allow students to better understand science because it is being combined with other subjects. In the national standards used by the NSTA it is also stated that science teachers should "work together as colleagues within and across disciplines and grade levels" (NAS, 1996, p.30). Earlier it was shown that the science standards called for students to be able to integrate curricula; this part of the science national standards expresses the need for teachers to integrate and work with teachers from other fields.

These prominent organizations (NCSS and NSTA) acknowledge the need for studying the possibilities of an integrated science and social studies curriculum. As previously stated, both of these ideas are stated in their respective national standards. National standards guide these national organizations and help determine what kinds of curricula are offered in schools across the nation. Since both organizations recognize the need for integrated curricula, it is important that pre-service teachers in the field study an integrated curriculum.

Several studies have documented the need for, and the effectiveness of, curriculum integration. One article researched the combining of curricula and recognized the importance of curriculum integration and stated it in a concise way. This article involved a team of teachers trying to find ways to increase student potential to learn. It stated that the "integrated science team's search to identify what would help students transfer knowledge from familiar to novel situations, we learned, as have others before us, that engagement and learning in multiple contexts enhances the transfer of knowledge" (Eggebrecht, et al., 1996, p. 1). Simply put, it was discovered that when students study information from a variety of educational contexts, such as integrating curricula, they learn the material easier and better.

The stated article claimed that students learn better and gain a better understanding of content presented from an interdisciplinary curriculum than from an isolated curriculum. If this is true, then it must be determined which curricula create a positive opportunity for integration. If two subject areas have little room for integration with each other, then areas must be discovered that can be correlated or crossed.

An example of research that has demonstrated that social studies and science are natural for integration can be found in the book "Cooperative Learning in Science" by social studies educators Robert Stahl. In the book it is stated that in many science classes "there is often neglected (or avoided) opportunity to work cross-curriculum with social studies, humanities, and language arts teachers" (Stahl & Jackson, 1996, p. 386). To reduce the chance that educators avoid social studies and science integration, the importance and benefits of this integration must be brought to the attention of pre-service teachers and regular classroom teachers in the field.

The importance of an integrated curriculum

One of the first things that teachers must consider are the many demands that are being placed on our schools to produce citizens who are able to work in a cooperative manner. When used properly, curriculum integration presents many opportunities for students to gain experience working in a group setting. Research done by R.W. Richberg and B.J. Nelson has shown that one of the best ways for students to become quality thinkers and team members is through an integrated curriculum. "The United States needs young people who have a first-class knowledge of the world and who are also outstanding problem solvers, team members, and thinkers" (Richberg & Nelson, 1998, p. 86). In the combining of classes, the students are exposed to a team concept and situations. By successfully handling these group situations in the integrated classrooms, it is hoped that students will be more prepared to handle group work after their high school careers.

Another example of the importance of an integrated curriculum is that it helps in the transfer of knowledge from the teacher to the student. An integrated curriculum can make it easier for the student to understand educational concepts and subject material. A benefit of curriculum integration that has been observed is the second chance that students have in learning the material. Students who could not understand a concept in an independent science or social studies course could possibly gain an understanding of the same concept in an integrated science and social studies course. "We have embraced integration to get rid of two serious deficiencies of traditional secondary school science instruction – deficiencies in transfer of knowledge and in transfer of authority" (Eggebrecht et al., 1996, p. 1). This statement in itself explains how research in the field

supports the idea that an integrated curriculum is an important way to improve our educational system. The integrating of curricula could possibly alleviate this deficiency in the transfer of knowledge.

More research into this field also demonstrates how an integrated curriculum is important for creating diversity in the learning possibilities in schools. Research by K.R. Harris and P.A. Alexander suggests that an integrated curriculum creates more ways of learning. "Diversity in our schools and classrooms and the challenge of high standards for all students contribute to the need for an integrated, constructivist approach that does not fail our students" (Harris & Alexander, 1998, p. 115). Diversity in this instance is creating a classroom in which students of all learning styles can successfully learn the material. Some students learn better by reading the material, others learn by hearing the material, and yet others' learning style is best served by a hands-on approach (Harris & Alexander, 1998, p. 115). Creating a diverse learning climate is a very important part of curriculum integration.

Students who do not have the same learning styles could be assisted by curriculum integration. Curriculum integration allows for all subjects to be taught using different approaches. This would give teachers more opportunities to try to cover different learning styles so that all students could understand the material. The more ways a topic can be presented, the more chances a student has to gain an understanding of the material presented. "Instinctively, we know we must focus on the needs of the individual learners, starting where the learners are and helping them to progress as far as they are able" (Richberg & Nelson, 1998, p. 85).

The importance of training teachers in an integrated curriculum

For classroom teachers to be able to properly combine the areas of social studies and science they need to be trained. Expecting an educator with no background in this area to be able to implement an integrated curriculum is not realistic or good for the education of their students. Training teachers in integrating curricula is the best way for them to be able to integrate subject areas in their classrooms. This study attempts to determine how preparing teachers will affect the possibility of their integrating these subject areas in their future classrooms.

"To raise challenges to curriculum integration in social studies is a daunting task" (Cross & Schug, 1998, p. 54). The best and most efficient way for a teacher to be able to successfully complete this task is to train teachers to be able to combine curricula. In their research B. Cross and M. Schug have shown that when teachers have a background in curricula integration, they will be more likely to use an integrated curriculum in their classrooms. This study will show that teachers who are trained in an integrated approach will be teachers who use this knowledge for their own integration.

A teacher who is properly prepared to integrate or cross curricula will "make meaningful connections and avoid triviality" (Cross & Schug, 1998, p. 56). Teachers who do not make meaningful connections in their classrooms would greatly hinder a quality integrated class. Teachers must be ready to handle and assimilate a curriculum that involves several different subject areas. They must be able to make meaningful connections in their classes that will enable students to learn more easily. Teachers must be prepared for all of the differences an integrated curriculum will bring to their classrooms. An example would be the different use of class time in a single curriculum

classroom as compared to an integrated curriculum classroom. "A teacher who plans a day centered around an integrated curriculum will arrange uninterrupted blocks of time in which extended activities can take place" (Manke, 1997, p. 64). The integration of curricula does however allow teachers more opportunities and different ways to cover the content areas with their students. When properly done, curriculum integration can be a very effective learning strategy.

"Although the value of subject matter integration is recognized, little progress has been made in widespread use of integrated subject matter in our schools and less progress has been made in research on subject matter integration" (Roehler, Fear, Herrmann, 1998, p. 202). This study is designed to address several of these problems. It explores the possibilities of subject matter integration in schools by the training of teachers to do so. It also addresses the possibilities of teachers who are trained to integrate curriculum being able to integrate curriculums in their classrooms.

HYPOTHESIS

The hypothesis of this study is that the pre-service elementary teachers in the fields of social studies and science who participate in the integrated methods course will have more positive attitudes and beliefs about the integration of these curricula than the pre-service elementary teachers who participate in the individual social studies or science methods courses.

III

METHOD

INTRODUCTION

The method used in this study is a Likert Scale survey given to approximately 80 pre-service elementary degree candidates at Oklahoma State University. The survey was developed for this particular study. The procedure consists of two control groups of individual curriculum methods classes and an experimental integrated curriculum methods class. The results of the study will be determined by a comparison of the pre-test and post-test surveys that will be administered to both the experimental and control groups. The experimental group consists of an integrated social studies and science pre-service elementary methods class. The control groups consist of a non-integrated social studies pre-service elementary methods class and another independent non-integrated science pre-service elementary methods class.

SUBJECTS

The population that was surveyed consisted of approximately 80 pre-service elementary teachers. All students enrolled in elementary social studies and science methods courses at Oklahoma State University participated in the survey. They were enrolled in a pre-service science methods class, pre-service social studies methods class, or a pre-service integrated science and social studies class. All student participants are pursuing elementary education degrees and teaching certification (Kindergarten through Eighth grade) from Oklahoma State University. The subjects reflect ethnic diversity and both genders are represented, but a majority of the students are Caucasian female. All participants have limited experience in the teaching field. Due to the nature of this study ethnicity and gender will not be considered.

INSTRUMENT

The instrument used to test the subjects was a Likert scale survey designed specifically for this type of study. This survey contained three sections. The first section consisted of 22 questions that asked the participants to indicate agreement or disagreement with the general idea of the integration of science and social studies. On the first section of the survey the answers could range from 1 (Strongly disagree) to 8 (Strongly agree). The survey also had a section containing 14 questions about the participant's feelings toward learning science and social studies in an integrated manner and another section containing 14 questions about the subject's feelings toward teaching

science and social studies in an integrated manner. The survey was administered to all of the participants in their methods courses. All the pre-service teachers in these methods courses were administered a pre-test survey and a post-test survey. The results of the pre-test survey was compared to the results of the post-test survey. This determined how the integrated curriculum methods course affected the attitudes and beliefs of the participants in the integrated course when compared to the attitudes and beliefs of the participants in the non-integrated courses.

The instrument used in this study was based upon another instrument that tested pre-service elementary teachers' attitudes and beliefs toward the integration of math and language arts. The validity and reliability were previously established by examining research reports available, which explored pre-service teachers' perceptions about these fields in general. Refer to Appendix C for reliability data on the instrument. Then consideration was given to discussions with students and colleagues in these fields dealing with the appropriateness of the statements. An earlier pilot version of the survey was administered to a sample group.

RESEARCH DESIGN

Control and experimental groups were used in this study. The control groups consisted of students taking independent science and social studies methods courses. The independent science and social studies groups have a single instructor for each class respectively. Each of these classes are taught completely independent of the other classes. The experimental groups are enrolled in consecutive science and social studies

methods courses that were taken concurrently and are taught by both the science and social studies methods instructors. The experimental integrated course had a single syllabus and was taught by both teachers sometimes in a team approach, although occasionally each teacher conducted class independently.

PROCEDURE

The study was conducted during the subjects' pre-service elementary methods courses. The first survey (pre-test) was administered to all participants at the beginning of the methods courses. The second survey (post-test) was administered to all participants at the completion of the methods courses. The change in attitudes and beliefs was measured from the beginning of the semester to the completion of the semester, when the participants finished their respective courses. The participants, pre-service elementary education students, were divided into three different methods courses. One group of participants was enrolled in the elementary science methods course, which was a control group. A second group of participants was enrolled in the elementary social studies methods course, which was a control group. The last group of participants was enrolled in an integrated elementary social studies and science methods course, which was the experimental group. At the beginning of the semester all participants were given a survey over their attitudes and beliefs of integrating the fields of social studies and science. After the completion of their respective courses, all participants completed the same survey. The differences in attitudes and beliefs of the control groups and the experimental group were measured. These measurements were compared using the

results of the survey given at the beginning of their methods courses and the results of the survey given at the completion of their methods courses.

A pilot study was conducted of this study. It was administered in the same manner as this study. Some modifications were made after the pilot study. For example, several questions were revised for clarity with the goal of increased reliability. While the pilot study enhanced the validity and reliability of the evaluation instruments, the results of the pilot study do not affect the study.

IV

RESULTS OF DATA

INTRODUCTION

This chapter reports the results of the survey which examined the attitudes and beliefs of pre-service teachers toward the integration of social studies and science. The data obtained was analyzed using ANCOVA with groups (Social Studies, Social Studies – Science, and Science) as independent variables and the survey questions of integrated instruction were used as the dependent variable. The intent was to find out whether there were any significant differences between groups with respect to their attitudes and beliefs toward integrated instruction. ANCOVA was used to control for differences in attitudes and beliefs prior to taking the course which taught the participants about integration. ANCOVA holds the pre-survey results of the participants constant, so that the post-survey results could be properly compared and evaluated. The survey questions were used as the dependent variables. The statements measured the subjects' attitudes and beliefs about integrating the teaching and learning of social studies and science. The purpose of the study was to add to our understanding of the way that pre-service teachers view the integration of social studies and science.

The results were analyzed question by question. The data obtained enabled me to find out how positive the pre-service teachers' attitudes and beliefs were toward the teaching and learning of integrated social studies and science. Also, I was looking to see how the attitudes and beliefs of the participants in the integrated course would compare to attitudes and beliefs of those in the control groups. This survey was divided into three sections. I will discuss the first section which dealt with the general background knowledge on integration which came from the "general integration section." The second section dealt with the subjects' feelings toward learning social studies and science integratively which came from the "integrative learning section." The third section dealt with the subjects' feelings toward teaching social studies and science integratively which came from the "integrative teaching section."

GENERAL INTEGRATION SECTION

Table 4.1 presents the results of the subjects' attitudes and beliefs toward their general knowledge of integrated instruction. An examination of the data on an 8-point scale revealed that the results were generally positive toward the integration of social studies and science. On the general integration survey, 10 of the 22 questions resulted in statistically significant findings. The results revealed several important findings. Refer to table 4.1 for the exact results. First, an examination of the means from the integration survey shows that the majority of the subjects, regardless of their group membership, reported a positive feeling about integrating social studies and science in the classroom. The phrasing of the question, in either a positive or negative way, had an effect on how the subjects responded. The questions phrased in a positive manner toward curriculum

integration, generally report a higher mean by the experimental group than by the control groups. The questions that were phrased in a negative way towards curriculum integration generally reported a higher mean by the control groups than by the experimental group.

Table 4.1
General Integration Section

Survey Statements	Groups					
	Experimental		Control			
	M	SD	M	SD	F(1,60)	P-value
1. I like the idea of teaching science and social studies together.	6.11	1.42	5.16	1.60	1.76	.189
2. I know how social studies and science can be taught together.	6.03	1.86	4.75	1.97	10.52	.002 *
3. I think science and social studies are best taught independently.	4.03	1.92	3.90	1.66	.254	.616
4. I do not feel that I could adequately teach science and social studies together.	3.15	1.78	4.24	2.11	5.24	.026 *
5. I know enough about both social studies. and science to connect them in the classroom.	6.07	1.46	4.37	1.53	21.54	.000 *
6. I will have enough time to integrate social studies and science in the classroom.	6.30	1.28	5.10	1.50	7.19	.009 *
7. I know enough materials on integrating science and social studies to adequately teach them together.	5.80	1.60	4.05	1.74	18.01	.000 *
8. Principals would not want me to teach social studies and science together.	2.84	1.56	2.91	1.23	.754	.398
9. Other teachers would not want me to teach social studies and science together.	2.88	1.47	3.02	1.25	.738	.394
10. Parents will not support integration efforts in the classroom.	3.15	1.54	3.10	1.19	.858	.358
11. A course for pre-service teachers that specifically addresses integration is unnecessary	2.42	1.81	3.05	1.87	.886	.350
12. If I had my choice, I would not teach social studies and science together.	3.57	2.19	3.50	1.93	1.16	.284
13. I do not understand how social studies can be taught at the same time.	2.46	1.63	3.70	1.97	11.66	.001 *
14. There are more advantages to teaching social studies and science together than there are to teaching them separately.	6.07	4.83	1.52	1.50	8.30	.005 *
15. I would be able to integrate science and social studies in the classroom.	6.15	1.68	4.59	1.84	16.07	.000 *
16. I do not see how social studies and science are related.	2.50	1.60	3.45	1.75	6.09	.016 *
17. There is not enough time to adequately teach science and social studies in the classroom.	2.46	1.50	3.32	1.31	2.58	.113
18. I do not have knowledge of enough materials to successfully integrate science and social studies in the classroom.	3.07	1.59	3.94	1.92	4.51	.038 *
19. Principals will support integration efforts in the classroom.	6.03	1.34	5.27	1.46	1.12	.292
20. Other teachers will support my integration efforts in the classroom.	6.15	1.18	5.18	1.61	3.00	.088
21. Parents will support integration efforts in the classroom.	5.92	1.41	5.21	1.49	.299	.587
22. A course that specifically addresses the integration of social studies and science for pre-service teachers is necessary.	6.73	1.45	5.37	1.87	3.59	.063

* Denotes the results were statistically significant.

From the integration survey there were many of the questions that were statistically significant. On question number 2, when asked "I know how social studies and science can be taught together," the experimental group (m=6.03 sd=1.86) reported higher means than the control groups (m=4.75 sd=1.97). On question number 5, "I know enough about both social studies and science to connect them in the classroom," the reported mean of the experimental group (m=6.07 sd=1.46) was statistically higher than the control groups (m=4.37 sd=1.53). The results of question number 6, "I will have the time to integrate social studies and science in the classroom," resulted in the experimental group (m=6.30 sd=1.28) being significantly higher than the control groups (m=5.10 sd=1.50). On question 7, when asked "I know enough materials on integrating science and social studies to adequately teach them together" the experimental group (m=5.80 sd=1.74) reported higher means than the control groups (m=4.05 sd=1.74). On question number 14, "There are more advantages to teaching social studies and science together than there are to teaching them separately," the mean of the experimental group (m=6.07 sd=4.83) results were significantly higher than the control groups (m=1.52 sd=1.50). The results of question 15, "I would be able to integrate science and social studies in the classroom," resulted in the experimental group (m=6.15 sd=1.68) scoring statistically higher than the control group (m=4.59 sd=1.84).

There were additional scores from the integration survey that resulted as being statistically significant. Question number 4, "I do not feel that I could adequately teach science and social studies together," resulted in the control groups (m=4.24 sd=2.11) reporting a higher mean than the experimental group (m=3.15 sd=1.78). On question number 13, when asked "I do not understand how social studies and science can be taught

at the same time," the mean of the control groups (m=3.70 sd=1.97) were statistically higher than the experimental group (m=2.46 sd=1.63). The results of question number 16, "I do not see how social studies and science are related," resulted in the control groups (m=3.45 sd=1.75) reporting a statistically higher mean than the experimental group (m=2.50 sd=1.60). Question number 18, "I do not have knowledge of enough materials to successfully integrate science and social studies in the classroom," resulted in the control groups (m=3.94 sd=1.92) reporting a statistically higher mean than the experimental group (m=3.07 sd=1.59).

INTEGRATIVE LEARNING SECTION

Table 4.2 presents the results of the participants' attitudes and beliefs toward the learning of social studies and science integratively. This section is titled "Feelings toward learning social studies and science integratively." Please refer to Table 4.2 for the exact results. An examination of the data revealed that there were generally positive results toward the integration of social studies and science. Any results over 4.00 on this scale are positive and the results of this section reported all means at 4.43 or higher on an 8-point scale.

This is section 2 of the 3-section survey, on which 5 of the 14 questions resulted in statistically significant findings. The respondents used a 1 – 8 scale that correlated with questions dealing with their feelings toward this topic. The closer a subject responded to 1, the more negative the response. The closer a subject responded to 8, the more positive the response.

Table 4.2

Integrated Learning Section

Experimental Control Totally disagree (1)---(8) Totally agree	Groups M – SD		M – SD		F(1,60)	P-value
1. Dull (1) ---- (8) Exciting	6.00	1.35	5.21	1.25	1.45	.232
2. Bad (1) ---- (8) Good	6.19	1.44	5.27	1.34	4.02	.049 *
3. Confused (1) ---- (8) Clear	5.26	1.86	4.54	1.48	2.22	.141
4. Unclear (1) ---- (8) Understandable	5.38	2.00	4.64	1.68	1.82	.182
5. Skeptical (1) ---- (8) Certain	5.46	1.65	4.48	1.42	4.16	.046 *
6. Ineffective (1) ---- (8) Effective	5.92	1.64	5.00	1.59	3.05	.086
7. unsure (1) ---- (8) Confident	5.34	1.91	4.64	1.79	1.46	.231
8. Difficult (1) ---- (8) Easy	5.15	1.97	4.83	1.40	.415	.522
9. Unprepared (1) ---- (8) Prepared	5.76	1.60	4.35	1.88	8.73	.004 *
10. Uninformed (1) ---- (8)Knowledgeable	5.69	1.66	4.45	1.80	6.87	.011 *
11. Time-consuming (1)----(8)Fast	5.57	1.62	4.75	1.63	1.68	.199
12. Rushed (1) ---- (8) Slow	4.96	1.37	4.43	1.59	.264	.609
13. Unsupported (1)---- (8) Accepted	6.07	1.19	4.89	1.46	9.09	.004 *
14. Scared (1) ---- (8) Confident	5.53	2.00	4.67	1.41	1.81	.183

* Denotes the results were statistically significant.

Question number 2 asked the subjects how "bad," which was the negative response or "good," which was the positive response, they felt about learning social studies and science integratively. This question resulted in the mean of the experimental group (m=6.19 sd=1.17) reporting a statistically higher mean than that of the control groups (m=5.27 sd=1.50). Question number 5 asked if the subjects felt "skeptical," a negative response, or "certain" a positive response, about learning social studies and science integratively. This question resulted in the mean of the experimental group (m=5.46 sd=1.62) reporting a statistically higher mean than the control groups (m=4.48 sd=1.70). Question 9 asked if the subjects felt "unprepared," which is the negative response, or "prepared," which is the positive response, about learning social studies integratively. This question resulted in the experimental group (m=5.76 sd=1.58) reporting a statistically higher mean than the control groups (m=4.35 sd=1.93).

On question number 10 the experimental group (m=5.69 sd=1.64) reported a significantly higher mean than the control groups (m=4.45 sd=1.95). This question asked whether the subjects felt "uninformed," being the negative response, or "knowledgeable" about learning social studies and science integratively. The last question from this section of the survey that resulted in the experimental group (m=6.07 sd=1.12) reporting significantly higher than the control groups (m=4.89 sd=1.60) was question number 13. This question asked the subjects if they felt "unsupported," the negative response, or "accepted," the positive response, about learning social studies and science integratively.

INTEGRATIVE TEACHING SECTION

Table 4.3 presents the results of the subjects attitudes and beliefs toward the teaching of social studies and science integratively. This section is titled "Feelings toward teaching social studies and science integratively." Please refer to Table 4.3 for the exact results. An examination of the data reveals that there were generally positive results toward the integration of social studies and science. Any results over 4.00 on this scale are positive and the results of this section were all 4.16 or higher on an 8 point scale.

This is section 3 of the 3-section survey. On this section 12 of the 14 questions resulted in statistically significant findings. The respondents used a 1 – 8 scale that correlated with questions dealing with their feelings toward this topic. The closer a subject responded to 1, the more negative the response. The closer a subject responded to 8, the more positive the response.

Table 4.3

Integrated Teaching Section

Experimental Control Totally disagree (1)---(8) Totally agree	Groups M – SD	M – SD	F(1,60)	P-value
1. Dull (1) ---- (8) Exciting	6.73 1.11	5.27 1.42	8.19	.006 *
2. Bad (1) ---- (8) Good	6.42 1.17	5.27 1.50	6.42	.014 *
3. Confused (1) ---- (8) Clear	5.84 1.61	4.70 1.71	7.68	.007 *
4. Unclear (1) ---- (8) Understandable	5.76 1.65	4.83 1.87	4.00	.050 *
5. Skeptical (1) ---- (8) Certain	5.80 1.62	4.35 1.70	10.88	.002 *
6. Ineffective (1) ---- (8) Effective	6.42 1.33	4.89 1.55	10.08	.002 *
7. unsure (1) ---- (8) Confident	5.69 1.66	4.54 1.95	4.35	.041 *
8. Difficult (1) ---- (8) Easy	5.15 1.91	4.51 1.62	1.80	.184
9. Unprepared (1) ---- (8) Prepared	5.73 1.58	4.16 1.93	11.36	.001 *
10. Uninformed (1) ---- (8)Knowledgeable	5.80 1.64	4.40 1.95	7.63	.008 *
11. Time-consuming (1)----(8)Fast	5.92 1.64	4.54 1.67	8.70	.006 *
12. Rushed (1) ---- (8) Slow	5.30 1.49	4.59 1.60	1.33	.252
13. Unsupported (1)---- (8) Accepted	6.30 1.12	4.78 1.60	13.36	.001 *
14. Scared (1) ---- (8) Confident	5.69 1.73	4.59 1.64	6.79	.012 *

* Denotes the results were statistically significant.

Question number 1 asked if the subjects felt that teaching social studies and science integratively was "dull," the negative response, or "exciting," the positive response. The experimental group (m=6.73 sd=1.11) reported a significantly higher mean than the control groups (m=5.27 sd=1.42). Question number 2 asked if the subjects felt "bad," the negative response, or "good," the positive response, about teaching social studies and science integratively. This question resulted in the experimental group (m=6.42 sd=1.17) reporting a statistically higher mean than the control groups (m=5.27 sd=1.50). Question 3 asked if the subjects felt "confused," the negative response, or "clear," the positive response, about teaching social studies and science integratively. This question resulted in the experimental group (m=5.84 sd=1.61) reporting a higher mean than the control groups (m=4.70 sd=1.71).

Question number 4 asked if the subjects felt "unclear," the negative response, or "understandable," the positive response, about teaching social studies and science integratively. This question resulted in the experimental group (m=5.76 sd=1.65) reporting a statistically higher mean than the control groups (m=4.83 sd=1.87). Question number 5 asked if the subjects felt "skeptical," the negative response, or "certain," the positive response, about teaching social studies and science integratively. This question resulted in the experimental group (m=5.80 sd=1.62) reporting a statistically higher mean than the control groups (m=4.35 sd=1.70). Question 6 asked if the subjects felt "ineffective," the negative response, or "effective," the positive response, about teaching social studies and science integratively. This question resulted with the experimental group (m=6.42 sd=1.33) reporting a statistically higher mean than the control groups (m=4.89 sd=1.55).

Question number 7 asked if the subjects felt "unsure," the negative response, or "confident," the positive response, about teaching social studies and science integratively. The experimental group (m=5.69 sd=1.66) reported a significantly higher mean than the control groups (m=4.54 sd=1.95). Question number 9 asked if the subjects felt "unprepared," the negative response, or "prepared," the positive response, about teaching social studies and science integratively. This question resulted with the experimental group (m=5.73 sd=1.58) reporting a statistically higher mean than the control groups (m=4.16 sd=1.93). Question number 10 asked if the subjects felt "uninformed," the negative response, or "informed," the positive response, about teaching social studies and science integratively. This question resulted with the experimental group (m=5.80 sd=1.64) reporting a higher mean than the control groups (m=4.40 sd=1.95).

Question number 11 asked if the subjects felt that teaching social studies and science integratively was "time-consuming," the negative response, or "fast," the positive response. The question resulted with the experimental group (m=5.92 sd=1.64) reporting a statistically higher mean than the control groups (m=4.54 sd=1.67). Question number 13 asked if the subjects felt "unsupported," the negative response, or "accepted," the positive response, about teaching social studies and science integratively. This question resulted in the experimental group (m=6.30 sd=1.12) reporting a statistically higher mean than the control groups (m=4.78 sd=1.60). Question number 14 asked if the subjects felt "scared," the negative response, or "confident," the positive response, about teaching social studies and science integratively. This question resulted with the experimental group (m=5.69 sd=1.73) reporting a statistically higher mean than the control groups (m=4.59 sd=1.64).

V

ANALYSIS, DISCUSSION AND CONCLUSIONS

INTRODUCTION

Although more research needs to be conducted concerning the attitudes and beliefs of pre-service teachers towards the integration of social studies and science, this study did reveal several significant findings. The most significant general conclusion was that pre-service teachers who completed the integrated social studies and science methods course had a much more positive attitude toward teaching social studies and science integratively. At the conclusion of the courses, students from all methods courses, both integrated and non-integrated, gave positive feedback concerning the teaching of these subjects together. However, the integrated course students reported results that were significantly higher and significantly more positive than the reported results of the students from the non-integrated courses. Both the integrated course students and the non-integrated students generally had a positive attitude toward learning social studies and science integratively. However, when surveyed at the conclusion of the courses, the integrated course students did have a more positive attitude for learning social studies and science integratively. The integrated course students results were statistically significantly higher for several of the questions. The survey results show that

the attitudes and beliefs for all groups are seen as positive toward the integration of social studies and science. The pre-service teachers who were enrolled in the integrated methods course generally did provide more positive responses on the survey than the pre-service teachers who were enrolled in the non-integrated methods courses.

CONCLUSIONS

On the general integration section, the integrated group's results reflected more positive attitudes and beliefs of the integration of social studies and science. The general integration section contained questions that could be grouped in the content areas of knowledge, resources, time, disposition, and support. Refer to Appendix B for the general integration section listed according to content area. Questions that fall under the category of knowledge asked the subjects if they thought they had the knowledge to fulfill what the question asked. The questions about resources asked the subjects if they thought they would have the necessary class time and materials to fulfill the requirements in their classroom. The questions that fall under the category of time asked the subjects if they thought they would have the time to fulfill the requirements. The questions that fall under the category disposition asked the subjects about their feelings toward the integration of social studies and science. The questions that fall under that category of support asked the subjects if they would have the necessary support to fulfill the requirements. The survey contained pairs of similar questions that were asked in opposite manners. These questions were asked in a positive manner and a similar question was phrased in an opposite, or negative, manner.

In the general integration section, several questions dealing with subject knowledge of integrating social studies and science revealed that the subjects who were enrolled in the integrated social studies and science course had a much stronger belief that they were prepared to teach social studies and science together. Even when the question was posed in a negative manner, the experimental group responded in a way that showed they were confident that they could teach social studies and science together. The control groups responded by not being as sure as the experimental group that, when finished with their courses, they would have the knowledge to teach social studies and science together.

There were several different sets of questions, all dealing with the subjects perceived knowledge of curriculum integration, that resulted with the experimental group believing that they had much more knowledge about curriculum integration than the control groups. This indicates that students who take courses in integrated subject areas believe that they will know how to teach these subjects integratively. This could also be seen as suggesting that the participants, who completed the integrated social studies and science methods courses, had a more favorable attitude toward integrating these two subject areas. The integrated students felt that they knew more about integrating these subjects and therefore seemed to favor it in a more positive manner than the other groups.

There were several other survey questions, from the general integration section, that resulted in the experimental group having a much more favorable attitude toward curriculum integration than the control groups. The experimental group had a stronger belief that they would have the time to integrate social studies and science than the control group did. This belief could come from the fact that the experimental group had

more training and more knowledge on the procedures of curriculum integration and would therefore be able to have better time management when it involves curriculum integration.

Another pair of general survey questions, in which the experimental group gave much more positive feedback than the control group, involved the idea that the pre-service teachers would have the proper resources for integrating social studies and science in the classroom. Resources, in this instance, would be whether or not the pre-service teachers have enough materials to have successful curriculum integration in their classrooms. The experimental group believed that they would have the resources to have successful curriculum integration in their classrooms. A reason that the experimental group would believe that they would have the materials and resources for curriculum integration is because they have taken the social studies and science methods course that was integrated. In this methods course the students received special training for them to have the ability to have successful curriculum integration in their classrooms. With this attention paid to integrating social studies and science, the students felt they were well prepared for integrating social studies and science.

The integrated learning section asked the subjects about their feelings, such as the disposition and support questions, toward learning social studies and science integratively. The majority of the responses on the 14 questions were favorable ones. This demonstrates that the majority of the pre-service teachers are in favor of learning social studies and science integratively. These positive responses were received from both the experimental and the control groups. The group that went through the integrated social studies and science methods course did have more positive responses toward

learning these two subject areas integratively. The results of the survey show that the experimental group felt more certain about learning social studies and science integratively than the control group. The integrative training that the experimental group received in their methods course, could be the reason that they felt more certain about learning social studies and science integratively.

The survey results from the experimental group also showed that they felt much more prepared, informed and supported toward the learning of social studies and science in an integrated manner. These reported feelings are very similar to the ones that were revealed on the general integration survey. On similar questions from the general integration survey, the experimental group reported more positive feelings about these questions than the control groups did. The experimental group received training and teaching in curriculum integration. The control groups received a traditional education in the areas of social studies and science. Because of the experimental group's training and preparations, preparations that the control groups did not receive, the experimental group felt more prepared, informed, and supported toward the learning of social studies and science in an integrated manner.

The integrated teaching section asked the subjects about their feelings toward teaching social studies and science integratively. The majority of the responses, from both the experimental and control groups, showed a positive feeling toward the teaching of social studies and science integratively. This demonstrates that the majority of the pre-service teachers studied are in favor of teaching social studies and science integratively. On this survey there are 14 questions, and the experimental group scored significantly higher on 12 of the questions. This shows that, despite all groups having relatively

positive feelings toward this integrated teaching, the experimental group had a much more positive feeling towards teaching social studies and science in an integrated manner. The training and preparations for curriculum integration that the experimental group received in the integrated social studies and science methods course could be the reason that the experimental group showed more positive feelings toward integrated teaching.

The integrated teaching survey results demonstrated how the integrated methods course could impact the way pre-service teachers view teaching in their classroom with an integrated curriculum. The participants who were enrolled in the integrated social studies and science methods course received the training appropriate for a teacher who is going to be using an integrated approach to their curriculum. The experimental group was much more positive in their feelings toward the idea of teaching social studies and science in an integrated manner. The group who underwent the special course and training for integration did show a much higher positive response than the control groups, which were enrolled in traditional methods courses. The integrated social studies and science methods course must have had a large positive effect on the subjects for their responses to be so overwhelmingly positive.

The experimental group received specific teaching and training in curriculum integration. One of the reasons that the experimental group could feel more positive about learning social studies and science integratively is because they might have been more open minded about this idea from the beginning of the courses. Most students had the choice of taking the social studies and science methods courses separately or in an integrated manner. The ones who would be more open minded and accepting toward the

idea of curriculum integration would be the ones who enrolled in the integrated social studies and science methods course.

RECOMMENDATIONS FOR FURTHER STUDY

The idea of integrating subject areas is a complex one. Educators must decide which subject areas should be integrated or which subject areas should not be integrated. The results of this study have been favorable for the idea of integration of social studies and science. Therefore the idea of curriculum integration merits further study. More longitudinal studies need to be completed to test whether the idea of integration is a truly lasting reform, or just one of the latest education fads.

Specific suggestions for additional research include:

a) Continue this study with successive classes of students in the integrated and non-integrated methods courses.

b) Compare the survey results of the social studies/science study to other similar studies in such areas as reading/math.

c) Carry out a follow up survey with these participants, as first year teachers, to see if and how their attitudes and beliefs toward integration have changed.

d) Conduct this study with the students in the secondary social studies and science methods courses.

e) Conduct structured interviews of the participants during their student teaching as a follow up survey.

VI

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APPENDIX A

SOCIAL STUDIES/SCIENCE INTEGRATION SURVEY

Social Studies/Science Integration Survey

Last 4 digits of Student ID Number: _____

Please select the extent to which you agree or disagree with the following statements.

	Totally Disagree							Totally Agree
1. I like the idea of teaching science and social studies together.	1	2	3	4	5	6	7	8
2. I know how social studies and science can be taught together.	1	2	3	4	5	6	7	8
3. I think science and social studies are best taught independently.	1	2	3	4	5	6	7	8
4. I do not feel that I could adequately teach science and social studies together.	1	2	3	4	5	6	7	8
5. I know enough about both social studies and science to connect them in the classroom.	1	2	3	4	5	6	7	8
6. I will have the time to integrate social studies and science in the classroom.	1	2	3	4	5	6	7	8
7. I know enough materials on integrating science and social studies to adequately teach them together.	1	2	3	4	5	6	7	8
8. Principals would not want me to teach social studies and science together.	1	2	3	4	5	6	7	8
9. Other teachers would not want me to teach social studies and science together.	1	2	3	4	5	6	7	8
10. Parents will not support integration efforts in the classroom.	1	2	3	4	5	6	7	8
11. A course for pre-service teachers that specifically addresses integration is unnecessary.	1	2	3	4	5	6	7	8
12. If I had my choice, I would not teach social studies and science together.	1	2	3	4	5	6	7	8
13. I do not understand how social studies and science can be taught at the same time.	1	2	3	4	5	6	7	8

14. There are more advantages to teaching social studies and science together than there are to teaching them separately.	1	2	3	4	5	6	7	8
15. I would be able to integrate science and social studies in the classroom.	1	2	3	4	5	6	7	8
16. I do not see how social studies and science are related.	1	2	3	4	5	6	7	8
17. There is not enough time to adequately teach science and social studies together.	1	2	3	4	5	6	7	8
18. I do not have knowledge of enough materials to successfully integrate science and social studies in the classroom.	1	2	3	4	5	6	7	8
19. Principals will support integration efforts in the classroom.	1	2	3	4	5	6	7	8
20. Other teachers will support my integration efforts in the classroom.	1	2	3	4	5	6	7	8
21. Parents will support integration efforts in the classroom.	1	2	3	4	5	6	7	8
22. A course that specifically addresses the integration of social studies and science for pre-service teachers is necessary.	1	2	3	4	5	6	7	8

Please circle the number on the scale for each pair of words that describes how you feel about **LEARNING** social studies and science integratively.

dull	1	2	3	4	5	6	7	8	exciting
bad	1	2	3	4	5	6	7	8	good
confused	1	2	3	4	5	6	7	8	clear
unclear	1	2	3	4	5	6	7	8	understandable
skeptical	1	2	3	4	5	6	7	8	certain
ineffective	1	2	3	4	5	6	7	8	effective
unsure	1	2	3	4	5	6	7	8	confident
difficult	1	2	3	4	5	6	7	8	easy
unprepared	1	2	3	4	5	6	7	8	prepared
uninformed	1	2	3	4	5	6	7	8	knowledgeable
time-consuming	1	2	3	4	5	6	7	8	fast
rushed	1	2	3	4	5	6	7	8	slow
unsupported	1	2	3	4	5	6	7	8	accepted
scared	1	2	3	4	5	6	7	8	confident

Please circle the number on the scale for each pair of words that describes how you feel about **TEACHING** social studies and science integratively.

dull	1	2	3	4	5	6	7	8	exciting
bad	1	2	3	4	5	6	7	8	good
confused	1	2	3	4	5	6	7	8	clear
unclear	1	2	3	4	5	6	7	8	understandable
skeptical	1	2	3	4	5	6	7	8	certain
ineffective	1	2	3	4	5	6	7	8	effective
unsure	1	2	3	4	5	6	7	8	confident
difficult	1	2	3	4	5	6	7	8	easy
unprepared	1	2	3	4	5	6	7	8	prepared
uninformed	1	2	3	4	5	6	7	8	knowledgeable
time-consuming	1	2	3	4	5	6	7	8	fast
rushed	1	2	3	4	5	6	7	8	slow
unsupported	1	2	3	4	5	6	7	8	accepted
scared	1	2	3	4	5	6	7	8	confident

APPENDIX B

GENERAL INTEGRATION SURVERY CONTENT AREAS

	Groups					
	Integrated		Non-Integrated			
Survey Statements and Categories	M	SD	M	SD	F(1,60)	P-value
Knowledge						
2. I know how social studies and science can be taught together.	6.03	1.86	4.75	1.97	10.52	.002 *
5. I know enough about both social studies. and science to connect them in the classroom.	6.07	1.46	4.37	1.53	21.54	.000 *
13. I do not understand how social studies can be taught at the same time.	2.46	1.63	3.70	1.97	11.66	.001 *
14. There are more advantages to teaching social studies and science together than there are to teaching them separately.	6.07	4.83	1.52	1.50	8.30	.005 *
15. I would be able to integrate science and social studies in the classroom.	6.15	1.68	4.59	1.84	16.07	.000 *
16. I do not see how social studies and science are related.	2.50	1.60	3.45	1.75	6.09	.016 *
Time						
6. I will have enough time to integrate social studies and science in the classroom.	6.30	1.28	5.10	1.50	7.19	.009 *
17. There is not enough time to adequately teach science and social studies in the classroom.	2.46	1.50	3.32	1.31	2.58	.113
Resources						
7. I know enough materials on integrating science and social studies to adequately teach them together.	5.80	1.60	4.05	1.74	18.01	.000 *
18. I do not have knowledge of enough materials to successfully integrate science and social studies in the classroom.	3.07	1.59	3.94	1.92	4.51	.038 *

* Denotes the results were statistically significant.

	Groups					
	Integrated		Non-Integrated			
Survey Statements and Categories	M	SD	M	SD	F(1,60)	P-value
Disposition						
1. I like the idea of teaching science and social studies together.	6.11	1.42	5.16	1.60	1.76	.189
3. I think science and social studies are best taught independently.	4.03	1.92	3.90	1.66	.254	.616 *
4. I do not feel that I could adequately teach science and social studies together.	3.15	1.78	4.24	2.11	5.24	.026 *
12. If I had my choice, I would not teach social studies and science together.	3.57	2.19	3.50	1.93	1.16	.284
Support						
8. Principals would not want me to teach social studies and science together.	2.84	1.56	2.91	1.23	.754	.398
9. Other teachers would not want me to teach social studies and science together.	2.88	1.47	3.02	1.25	.738	.394
10. Parents will not support integration efforts in the classroom.	3.15	1.54	3.10	1.19	.858	.358
11. A course for pre-service teachers that specifically addresses integration is unnecessary	2.42	1.81	3.05	1.87	.886	.350
19. Principals will support integration efforts in the classroom.	6.03	1.34	5.27	1.46	1.12	.292
20. Other teachers will support my integration efforts in the classroom.	6.15	1.18	5.18	1.61	3.00	.088
21. Parents will support integration efforts in the classroom.	5.92	1.41	5.21	1.49	.299	.587
22. A course that specifically addresses the integration of social studies and science for pre-service teachers is necessary.	6.73	1.45	5.37	1.87	3.59	.063

* Denotes the results were statistically significant.

APPENDIX C

RELIABILITY INFORMATION

SURVEY RELIABILITY

The instrument used in this study was based upon a survey used in a similar study. The earlier study was examining the attitudes and beliefs of pre-service teachers toward the idea of integrating mathematics and reading. The validity and reliability of the instrument were established by the earlier study.

> To ensure that the statements included in the survey were appropriate and valid, we took a number of steps. First, we examined research studies available which explored pre-service teachers' perceptions about mathematics and reading in general. Second, we took into consideration extensive feedback solicited from discussions with colleagues and students concerning the clarity and appropriateness of the statements. Third, we piloted an earlier version of the survey with a sample of pre-service and in-service teachers. All of these steps resulted in refinement to the final version of the survey which was used in this study. The survey instrument had an internal reliability of .89 for the statements, suggesting that the scales were measuring the same construct (Reinke, Mokhtari & Wilner, 1997, p. 64).

APPENDIX D

INSTITUTIONAL REVIEW BOARD APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Date: May 28, 1999 IRB #: ED-99-117

Proposal Title: "THE ATTITUDES, BELIEFS, AND KNOWLEDGE OF PRE-SERVICE ELEMENTARY TEACHERS TOWARDS THE INTEGRATION OF SOCIAL STUDIES AND SCIENCE CURRICULA"

Principal Investigator(s): Leah Engelhardt
Chris Moseley
Jeremy Cook

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Signature:

Carol Olson, Director of University Research Compliance

May 28, 1999
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

VITA

Jeremy W. Cook

Candidate for the Degree of

Master of Science

Thesis: THE ATTITUDES AND BELIEFS OF PRE-SERVICE ELEMENTARY EDUCATION TEAHCERS TOWARD THE INTEGRATION OF SOCIAL STUDIES AND SCIENCE CURRICULA

Major Field: Curriculum and Instruction

Biographical:

Personal Data: Born in Wewoka, Oklahoma, On May 25, 1969, the son of Chelsea C. and Carol Cook.

Education: Graduated from Henryetta High school, Henryetta Oklahoma in May of 1988. Received Bachelor of Arts degree in History from Oklahoma State University, Stillwater, Oklahoma in May, 1992. Completed the requirements for the Master of Science degree with and major in Curriculum and Instruction at Oklahoma State University in December, 1999.

Experience: Employed as a Teaching Assistant at Oklahoma State University 1998 – 1999; Employed as a Tutorial Program Coordinator at Oklahoma State University 1998 – 1999; Employed as a Social Studies Teacher at Dewar Public Schools 1995 – 1998; Employed as the Gifted and Talented Program Coordinator at Dewar Public schools 1995 – 1998; Employed an English Teacher in L'viv, Ukraine, 1994; Employed as an English Teacher in Ternopil, Ukraine, 1993.

Professional Memberships: Phi Delta Kappa, National Council for the Social Studies.