The Correlation Between Certain Variables and the Knowledge, Attitude, and Behavior of Teachers Who Have Done Curriculum Mapping

by

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Abstract

This study was designed to determine whether there is a correlation between the variables of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom and the knowledge, attitude, and behavior of the teachers. Teachers from five schools who have done curriculum mapping were surveyed to determine whether there was any correlation. The results of the survey indicated that there was a significant difference between the number of grades in the classroom relating to the attitude of the teachers.

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CHAPTER I: THE PROBLEM

Introduction

Too often, schools are nothing more than a collection of one room schools under one roof. Glickman, Gordon and Ross Gordon call this the "Legacy of the One-Room Schoolhouse" (2004, pp. 20-21). This is a legacy that can lead to isolation of the teachers in even the smallest schools. Each teacher creates his own little kingdom within the four walls of his classroom. He may feel that what goes on in the other classrooms of the school does not impact what happens in his classroom, and what happens in his classroom affects only his students. Something needs to be done to bring all of the teachers in a school together in a way that is going to improve the delivery of the school's curriculum. Teachers need to know that what happens in their classrooms has a great impact on all of the other teachers in their school. They need to work cooperatively to develop and implement an effective curriculum.

Problem Statement

The Wisconsin Evangelical Lutheran Synod (WELS) Commission on Lutheran Schools (CLS), has recently been advocating the use of Curriculum Mapper. Curriculum Mapper is a web-based software tool which may contribute to a teacher's ability to more effectively and efficiently plan their curriculum. There are factors that could inhibit an individual's ability to do curriculum mapping well. The study examines the individual teacher's knowledge, attitude, and behavior toward curriculum mapping as it correlates to the teacher's sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom. Anticipating factors that inhibit the efficient implementation of curriculum mapping could make this process more effective.

Purpose of the Study

This quantitative study attempts to determine if there is a correlation between sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom on the knowledge, attitude, and behavior of teachers in selected schools of the Wisconsin Evangelical Lutheran Synod who have done curriculum mapping.

Research Question

What correlation is there between a teacher's sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom and the knowledge, attitude, and behavior of teachers who have done curriculum mapping?

Definition of Terms

Curriculum mapping

> "Curriculum mapping is a process by which all teachers document their own curriculum, then share and examine each other's curriculums for gaps, overlaps, redundancies, and new learning, creating a coherent consistent curriculum within and across schools that is ultimately aligned to standards and responsive to student data and other school initiatives" (Udelhofen, 2005, p. XVIII).

Mult-grade classroom

> A classroom in which a teacher is responsible for teaching more than one grade level of students.

Assumptions and Limitations of the Study

This study surveyed teachers in five schools of the Wisconsin Evangelical Lutheran Synod that have been doing curriculum mapping for at least two years. An attempt was made to find schools whose faculties had remained relatively constant over the last two years.

The study utilized a survey to gather data that were used to explore the relationship between sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom with knowledge, attitude, and behavior toward curriculum mapping.

The survey was conducted among teachers of schools in the Wisconsin Evangelical Lutheran Synod. The schools are small private schools with enrollments of less than 300 students in grades K-8. The teachers who participated in this study are from schools that have been progressive in carrying out curriculum mapping in their schools and may not necessarily represent teachers in other school systems.

Methodology

This study surveyed thirty-one WELS teachers in five different schools. Teachers were asked to reflect on their knowledge, attitude, and behavior toward curriculum mapping. Teachers completed a survey online using Survey Monkey or by using a paper survey. The responses of teachers who used the paper approach were manually entered into Survey Monkey.

Summary

Good school leaders look for ways to improve the education that takes place in their schools. Many experts (Hale, 2008; Jacobs,1997; Udelhofen, 2005) agree that curriculum mapping tools contribute to more efficient and effective curriculum implementation for individual teachers and their institutions. The leaders face challenges when implementing new ideas like curriculum mapping. If the leaders could identify some of the road blocks that could possibly deter the successful implementation of curriculum mapping, it could help them to more effectively and efficiently implement curriculum mapping tools.

A teacher's knowledge, attitude, and behavior all play roles in the successful implementation of curriculum mapping. There are factors that affect a teacher's knowledge, attitude, and behavior. This study examines whether the factors of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom affect the teacher's knowledge, attitude, or behavior toward curriculum mapping.

CHAPTER II: LITERATURE REVIEW

Introduction

Teachers make important decisions about curriculum. First of all, many schools choose to align their curriculum to state standards. Second, in certain parts of the curriculum teachers ultimately decide what is taught in their classrooms. Third, teachers set expectations for their students as well as for themselves. Finally, teachers relate to the other teachers in a school, whether they teach the same grade level or a higher or lower one.

Curriculum mapping has become popular among some schools of the Wisconsin Evangelical Lutheran Synod and other schools around the country. Udelhofen (2005, p. 3) wrote,

> Curriculum mapping is an alternative that provides a process-oriented model that is respectful of the knowledge of every teacher, encourages collaboration and reflection, … that consists of procedures that include easy curriculum modification, revision, and updates on a timely basis, resulting in a current, reality-based, standards-aligned curriculum. (p. 3)

Standards Express What is to be Taught

The standards movement is a relatively recent attempt to identify what is to be taught in various subject areas at certain levels of education. In the past, textbook and testing companies made most of the decisions about what was being taught in schools. Sandall (2003, p.15) wrote, "An examination of the actual state of elementary science revealed that textbooks and other published materials determined student outcomes. Teachers, who were often not confident in science, selected the curriculum programs, and the majority of the teachers used textbooks." For the past twenty years or so professional organizations and state agencies have taken the initiative

to write their own standards in an attempt to control what is taught. Kendall and Marzano (1995, p. 1) stated:

> We have entered an age when information grows so rapidly that subject-matter experts are compelled to review their assumptions about the essential knowledge and skills of their disciplines. Clearly there is a need for expert subject-area guidance to determine what students should know and be able to do to prepare themselves for college and the world of work. (p. 1)

Schmoker and Marzano (2003, p. 19) wrote, "Clear, intelligible standards are a pillar of higher achievement. Aligned with appropriate assessments, they can help us realize the dream of learning for all. They are the heart of the infrastructure for school improvement." They also warn, however, that the rush to create standards has resulted in standards that are poorly written, and that are very difficult to attain. "In the case of standards, quantity is not quality" (p. 19).

Teachers Decide What is Taught

A current practice in many schools is that teachers decide the curriculum for their classrooms. It is becoming increasingly important for teachers to make wise decisions about what should be included in the curriculum. Florian (1999) concluded that there is not enough instructional time to cover the curricular standards required at each grade level; therefore, teachers must decide what will be taught and what gets eliminated. She also stated that "Teachers appear to be able to make judgments about what content is important and which is appropriate for teaching at specific grade levels, based on their experience" (Florian, 1999, p. 13). As the body of knowledge that is available and required for students to know grows, this is a skill that becomes very important for teachers to practice.

The study of *Characteristics of Improved School Districts* (Shannon and Bylsma, 2004, p. 35) indicated that improved and effective schools have the marks of quality teaching and learning. According to that study, these marks include high expectations and accountability for the adults, coordinated and aligned curriculum and assessment, and coordinated and embedded professional development. Strong educational leaders will implement policies and practices which enhance quality teaching and learning.

Collaboration is Key

Many studies indicated that quality curriculum and effective instruction occur when teachers work together. Clair, Adger, Short and Millan (1998, p. 24) stated, "Teachers are often segregated by grade level, subject, or program with little time to discuss teaching and learning." Clair, et al (1998) recommended that teachers in each school have time to discuss curriculum with one another to improve the instruction that occurs. Miller and Cross (2001) studied teachers at a Florida school who did an action research project on their writing curriculum. They found that changes and improvements to the writing curriculum were extremely successful when those changes were made collaboratively. This idea of collaboration was supported by Fullan, Bartani, & Quinn (2004, p. 44) who stated, "Teams working together develop clear, operational understandings of their goals and strategies, fostering new ideas, skills and a shared commitment to district-wide development."

Cobb (2005, p. 2) said, "There is great power for teachers and administrators who share dialogue about student work, instruction methods and specific uses of curriculum." She advocates doing this by having "vertical" teams, made up of teachers from across grade levels, which meet at least three times per year. These meetings allow teachers to learn from one another and also understand how the curriculum flows from one grade level to another.

Mapping Curriculum

Curriculum mapping was developed in the 1970's (Koppang, 2004). It is a method of aligning the written and taught curriculum that More recently, curriculum mapping has been expanded due to the use of technology. Sumsion and Goodfellow (2004) interviewed early childhood teachers who were asked to map their curriculum. Sumsion and Goodfellow found that most staff felt that curriculum mapping "provided a valuable opportunity for reflection on their unit and assisted them to identify directions to pursue in their teaching and changes they might make to their unit outlines." Another teacher stated, "I felt encouraged, it made me feel like we're doing a pretty good job" (Sumsion and Goodfellow, 2004, p. 339).

In curriculum mapping, each teacher in the school records the content and skills that were covered in his classroom (Kopang, 2004). The curriculum map includes the amount of time that was taken to cover those skills. The assessments that were used to evaluate the successful completion of each skill may also be recorded, and by using certain software the teacher can link the skills that were covered to the standards of his state.

There are many benefits of doing curriculum mapping, but the most important may be providing an opportunity for teachers to communicate about what is being taught in each classroom (Kopang, 2004). It is this collaboration that helps teachers know what is being taught by the other teachers in the school.

Sumsion and Goodfellow (2004, p. 342) also warned that curriculum mapping may not be the panacea that some would make it out to be:

> We caution, however, against the use of superficial approaches to curriculum mapping or simplistic measures advocated in some of the literature. Indeed, if the

> potential of curriculum mapping is to be realized, it will need to be the focus of far more extended methodological discussions. (p. 342)

Jarchow and Look (2001) indicated that teachers going into the process of curriculum mapping had questions about doing the mapping. One question teachers had was whether the mapping was being done for improving the curriculum, or as another way to monitor what was going on in the classroom. A second question was about time. Teachers were concerned about the amount of time that they would have to invest in the process. Finally, teachers wondered whether or not their work would be of any use when the process was completed. They had a sort of "Now what?" mentality.

Correlation Between Certain Variables and Curriculum Mapping

A review of relevant literature uncovered only one study which examined certain variables and teachers' attitudes toward curriculum mapping. In his doctorate dissertation, Lucas (2005) produced a study which was designed to determine the "teacher perceptions on the efficacy of curriculum mapping as a planning and alignment tool." (p. 94) Lucas said that there were differences in teacher perceptions based on the level of instruction (i.e., Elementary, Middle, and High), differences based on the total teaching experience of the professional, and also the level of knowledge held by teacher with regard to the mapping process."

Summary

There are many elements of curriculum mapping that are easily recognized as significantly beneficial to the overall teaching experience. Many principals may want to use curriculum mapping to improve their schools and enhance student achievement. A principal would want to avoid some of the more significant road-blocks that could hinder the efficient or effective implementation of curriculum mapping. Having a tool which helps teachers to

recognize and implement state standards, makes them feel more involved in the decision process of what is taught, provides a conduit for stronger communication, and provides a structure for the mapping to occur would unquestionably contribute to the success of their curriculum mapping. There are many factors that might affect the individual teacher's ability to carry out curriculum mapping. In this study, the teacher's sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom are the factors that are examined.

CHAPTER III: METHODOLOGY

Introduction

Content and standards seem to continually be added to the elementary school curriculum. As additions are made, teachers are challenged with what actually gets taught. Curriculum mapping is a process through which teachers document what was actually taught. Once the maps are completed and reviewed, they can provide the faculty with a blueprint that will provide them with a clear understanding of what should be taught in the future. It is also a way to prevent the unnecessary repetition of some topics. The time, money and effort that is required to do curriculum mapping well is a big investment for teachers and schools. Are there variables that inhibit the use of curriculum mapping in WELS schools, or are there variables whose presence may indicate that curriculum mapping will be used effectively in WELS schools?

Research Question

What correlation is there between a teacher's sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom and the knowledge, attitude, and behavior of teachers who have done curriculum mapping?

Research Design and Procedures

This quantitative study utilized a survey that was administered to thirty-one Lutheran elementary school teachers in the Wisconsin Evangelical Lutheran Synod. The survey was administered either online using Survey Monkey or, at the teacher's request, using paper and pencil. The responses of those who used the paper and pencil approach were manually entered into Survey Monkey by the project administrator. Four of the thirty-one participants completed the survey using paper and pencil. Once the survey collection process was closed, the results were downloaded from Survey Monkey into an Excel spreadsheet form.

Population and Sample

Five Lutheran elementary schools of the Wisconsin Evangelical Lutheran Synod were selected to participate in this study on the basis of their use of curriculum mapping. Mr. Todd Russ, WELS trainer for Curriculum Mapper, recommended schools that were using the curriculum mapping process. An attempt was made to select schools where curriculum mapping had been taking place for at least two years. An attempt was also made to survey teachers from schools whose faculties had remained relatively constant over at least the last two years. Two schools from Minnesota, two from Wisconsin and one from Florida were selected. Fifty-one teachers were invited to participate in the study. Thirty-one of those fifty-one teachers (61%) completed a survey.

The sample was divided into two groups for each of the four variable categories to determine how these factors affected knowledge, attitude, and behavior toward curriculum mapping. First the sample of thirty-one teachers was grouped by sex, male or female. Next they were grouped according to years of teaching experience. One group was ten years or less teaching experience, and the other was more than ten years teaching experience. Third, they were grouped according to the number of hours of training in curriculum mapping. One group had five hours or less of training in curriculum mapping. The other group had more than five hours of training in curriculum mapping. Finally, the teachers were grouped by the number of grades in the classroom. One group of teachers was single grade classroom teachers. The second group consisted of teachers who taught in multi-grade classrooms.

Nineteen of the thirty-one teachers in the study were females. Twelve of the teachers were males. Fourteen teachers had ten or less years of teaching experience. Seventeen teachers had more than ten years of experience. Nineteen had five hours of less of training in curriculum

mapping. Twelve teachers had more than five hours of training in curriculum mapping. Sixteen of the teachers taught single-grade classrooms. Eleven were teachers in multi-grade classrooms, and four taught in a departmentalized situation. In the analysis, the teacher's who taught in a departmentalized situation were not considered in either a single-grade or multi-grade classroom situation.

Table 1

Grouping of independent variables

Independent Variable Categories	Variable Groupings	
	Group 1(*n*)	Group 2 (*n*)
Sex	Male (12)	Female (19)
Years of Teaching Experience	10 years or less (14)	More than 10 years (17)
Hours of Training in Curriculum Mapping	5 hours or less (19)	More than 5 hours (12)
Number of Grade Levels in Classroom	Single grade (16)	Multi-grade (11)

Instrumentation

The instrument (Appendix A) of this project was a questionnaire with Lickert-type response questions. First, teachers were asked to respond to a series of positively worded statements by using a 5-point agreement response scale: strongly disagree, disagree, uncertain, agree and strongly agree. In order to provide a check and balance to those questions, teachers were also asked to reflect on whether their knowledge, attitude, or behavior had changed since they began using curriculum mapping. They were asked to answer more frequently, less frequently or about the same in response to those questions.

The instrument was used to measure knowledge, attitude, and behavior about the classroom curriculum. Three questions were designed to measure teacher's knowledge of the classroom curriculum. The knowledge being measured included:

1. What is taught in grades above and below the grade(s) taught by the teacher
2. What to expect from the students entering the teacher's classroom
3. Awareness of state standards

Two questions were designed to measure the teacher's attitude toward the classroom curriculum. The attitudes measured included:

1. Feeling of confidence that the teacher was teaching the correct material
2. Feeling that curriculum mapping was worth the time and effort

Three questions were designed to measure the teacher's behavior involving the classroom curriculum. The behaviors measured included:

1. Providing input on curriculum changes
2. Focusing the curriculum on the Scriptural perspective
3. Making changes to the curriculum based on an understanding of the entire curriculum

The instrument was field tested with several experienced teachers and MLC Graduate Staff faculty members. Improvements and changes were made after the field-testing and before the instrument was actually used in the study.

Data Analysis Procedures

In some of the Lickert-type questions, there were categories of strongly disagree, disagree, uncertain, agree, and strongly agree. The strongly disagree and disagree responses were assigned an ordinal value of 1, the uncertain responses were assigned a value of 2, and the agree and strongly agree responses were assigned a value of 3. In the other Lickert-type responses

which asked teachers whether certain knowledge, attitude, or behavior was present more frequently, less frequently, or about the same before curriculum mapping than after, less was assigned a value of 1, about the same was given a value of 2, and more was given a value of 3. For some questions, one answer choice was "does not apply." This response was not considered in the analysis.

Table 1 below shows how the seventeen questions with Lickert-type ordinal indicators were combined to quantify into single values the dependent variable categories of knowledge, behavior, and attitude weighted to reflect five point agreement responses and three point value judgment responses.

Table 2

Questions for independent variables

	Question Number																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Knowledge		X	X	X	X		X	X		X	X				X		
Behavior	X	X	X			X	X						X	X	X	X	
Attitude	X		X				X	X	X	X	X	X					X

Pearson's Chi-square tests were used to measure whether there was significant difference between the independent variables of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom to the quantified values of the dependent variables of knowledge, attitude, and behavior.

Limitations

The accuracy of the survey instrument used in the study required a fair and accurate reflection of teachers on their knowledge, attitude, or behavior over a period of time due to the

use of curriculum mapping. Using a survey may not be the most accurate way to assess a teacher's knowledge, attitude, or behavior.

The survey was conducted among teachers of schools in the Wisconsin Evangelical Lutheran Synod. The schools are small private schools with enrollments less than 300 students in grades K-8. The teachers who participated in this study come from faculties that may be considered progressive, since they adopted the use of curriculum mapping sooner than other schools. These teachers may not represent other teachers in Wisconsin Evangelical Lutheran Synod schools or teachers in other school systems.

CHAPTER IV: RESULTS

Introduction

This quantitative study was designed to evaluate the significant difference between four independent variables of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom and the dependent variables of knowledge, attitude, and behavior of teachers who have used the curriculum mapping process. Pearson's Chi-square test was used to evaluate the significant difference between the groups in the dependent variables for the independent variables. The null hypothesis states that there is no significant difference between the sample groups divided on the basis of the independent variables with respect to the dependent variable data gathered using the survey instrument.

The metric consisted of 17 closed ended questions that were combined in three groups to form the dependent variable categories of knowledge, behavior, and attitude. The data sample was divided into two groups respective to the four variable categories. For example, for the variable of sex, one group represents male and the other female. These groups were compared using Pearson's Chi-square test to evaluate whether the responses of the two groups significantly differed in the categories of knowledge, attitude, and behavior with respect to the curriculum mapping process.

To convert the ordinal values from the quantified ordinal values of the combined questions into dependent categories of knowledge, attitude, and behavior, the terms "negative response," "neutral response," and "positive response" were used. The quantified ordinal value of 1.66 and less is a negative response. Quantified ordinal values greater than 1.66 but less than 2.33 are neutral responses, and quantified ordinal values greater than 2.33 are positive responses.

The responses were classified as negative responses, neutral responses, and positive responses. The negative responses were those who answered “strongly disagree” or “disagree” on questions 1 through 9, or who answered “less” on questions 10 through 17. The neutral responses were those who answered “uncertain” on questions 1 through 9 or “about the same” on questions 10 through 17. The positive responses were those who selected “agree” or “strongly agree” on questions 1 through 9, or those who chose “more” on questions 10 through 17.

The dependent variables of knowledge, attitude, and behavior that were identified included teachers’ input into making curricular changes, knowledge to make informed decisions about the curriculum, focusing the curriculum on the Scriptural perspective, knowing what is taught by the teacher(s) in the grade level(s) above or below theirs, making changes to the curriculum, and eliminating portions of curriculum and textbook information. Teachers in the study were asked to evaluate whether they agreed with the statement that curriculum mapping is worth the time and effort, and they were also asked to try to compare their knowledge, attitude, and behavior toward curriculum before and after doing curriculum mapping.

Twelve Pearson’s Chi-square tests were performed on the various possible combinations between the independent variables of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom and the dependent variables of knowledge, attitude, and behavior.

The Chi-Square test result was evaluated to the standard confidence level for the probability of significant difference of 95% ($p<.05$) between the two groups. Each Chi-square test consisted of the two groups for each of the independent categories of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom and the three dependent variable categories of knowledge, attitude, and behavior.

This two by three matrix yielded two degrees of freedom (*df*). Bruning and Blintz (1977) reproduced Pearson's original Chi-square chart in Appendix D of their Computational Handbook of Statistics. A Chi-Square of 6.0 or greater would be required in order for there to be a significant difference between the responses of the two groups.

Survey Questions

There were 17 questions which participants rated on two different scales. These questions were classified into groups having to do with knowledge, attitude, and behavior. A Pearson's Chi-square test was performed with each group of questions against four different independent variables. The four variables were sex, experience, the number of grade levels in a classroom, and length of training in the Curriculum Mapping process.

There were nine questions which were classified as knowledge questions. These nine questions included:

2) Curriculum mapping has given teachers more opportunities or knowledge to make informed decisions regarding curriculum.

3) Curriculum mapping has helped me prepare my classroom curriculum so that it better focuses on the Scriptural perspective.

4) In the area(s) of the curriculum that have been mapped, I know what is taught by the teacher(s) in the grade level(s) below mine.

5) In the area(s) of the curriculum that have been mapped, I know what is taught by the teacher(s) in the grade level(s) above mine.

7) Curriculum mapping has given me more confidence to eliminate portions of curriculum and textbook information.

8) Curriculum mapping has clarified my expectations of the students in my classroom.

10) After my experience with curriculum mapping, my familiarity with what is taught by the teacher(s) in the grade level(s) below mine is:

11) After my experience with curriculum mapping, my familiarity with what is taught by the teacher(s) in the grade level(s) above mine is:

15) After my experience with curriculum mapping, my consideration of state standards while preparing my curriculum is _____ than it was before using curriculum mapping.

There were nine questions that were classified as attitude questions. These questions were:

1) After using curriculum mapping teachers have more input into making changes to the school's curriculum than they did before using curriculum mapping.

3) Curriculum mapping has helped me prepare my classroom curriculum so that it better focuses on the Scriptural perspective.

7) Curriculum mapping has given me more confidence to eliminate portions of curriculum and textbook information.

8) Curriculum mapping has clarified my expectations of the students in my classroom.

9) Curriculum mapping has been worth the time and effort.

10) After my experience with curriculum mapping, my familiarity with what is taught by the teacher(s) in the grade level(s) below mine is:

11) After my experience with curriculum mapping, my familiarity with what is taught by the teacher(s) in the grade level(s) above mine is:

12) After my experience with curriculum mapping, my confidence to eliminate portions of the curriculum and textbook information is _____ than before using curriculum mapping.

17) If your school uses curriculum mapping software, how comfortable are you in using it?

There were nine questions that were classified as behavior questions. These questions were:

1) After using curriculum mapping teachers have more input into making changes to the school's curriculum than they did before using curriculum mapping.

2) Curriculum mapping has given teachers more opportunities or knowledge to make informed decisions regarding curriculum.

3) Curriculum mapping has helped me prepare my classroom curriculum so that it better focuses on the Scriptural perspective.

6) I have made changes to my curriculum as a result of curriculum mapping.

7) Curriculum mapping has given me more confidence to eliminate portions of curriculum and textbook information.

13) After my experience with curriculum mapping, discussion among teachers about curriculum content of different grade levels has been _____ than before using curriculum mapping.

14) After my experience with curriculum mapping, the frequency of spending time in faculty meetings discussing curriculum

15) After my experience with curriculum mapping, my consideration of state standards while preparing my curriculum is _____ than it was before using curriculum mapping.

16) After my experience with curriculum mapping, the frequency of spending time informally discussing curriculum is _____ than it was before using curriculum mapping.

Null Hypothesis

There is no significant difference between the sample groups divided on the basis of the independent variables of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom with respect to the dependent variables of knowledge, attitude, or behavior.

Data

The data was collected and displayed in twelve tables. Each table indicates the number of negative responses, neutral responses and positive responses for each combination of independent variables to each dependent variable. The Pearson's Chi-test result is also listed. A Pearson's Chi-test result of six or greater would indicate that there is a significant difference between the responses of the two groups. Table 3 below is an index of the tables which follow.

Table 3

Index of complex Pearson's Chi-square test data tables.

Independent Variable Categories	Dependent Variable Categories		
	Knowledge	Attitude	Behavior
Sex	Table 3	Table 7	Table 11
Years of Teaching Experience	Table 4	Table 8	Table 12
Hours of Training in Curriculum Mapping	Table 5	Table 9	Table 13
Number of Grade Levels in Classroom	Table 6	Table 10	Table 14

Knowledge

The first dependent variable is a teacher's knowledge about curriculum mapping. Tables 4 through 7 show the types of responses given by the two groups in each of the teachers' characteristics of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom.

Twenty of the thirty-one teachers had positive responses on questions related to their knowledge of curriculum and curriculum mapping. The first independent variable that was tested against knowledge was the sex of the teacher. Eighty-three percent of males responded positively about their knowledge of curriculum and curriculum mapping. Only forty-two percent of females responded positively. Pearson's Chi-square test result for knowledge vs. sex was 3.1816.

Table 4

Pearson's Chi-square test data of Knowledge vs. Sex

	Knowledge vs. Sex	
Response	Male	Female
Negative Response	0	1
Neutral Response	2	8
Positive Response	10	10
Pearson ChiTest Result =	3.1816	

The second independent variable that was tested against knowledge was years of teaching experience. Seventy-one percent of teachers with ten years or less experience responded positively. Fifty-nine percent of the teachers with more than ten years of teaching experience responded positively. Pearson's Chi-square test result for knowledge vs. experience was 1.1202.

Table 5

Pearson's Chi-square test data of Knowledge vs. Experience

	Knowledge vs. Experience	
Response	10 years or less	More than 10 years
Negative Response	0	1
Neutral Response	4	6
Positive Response	10	10
Pearson Chi-Test Result =	1.1202	

The third independent variable that was tested against knowledge was hours of training in curriculum mapping. Sixty-three percent of teachers with five hours or less training in curriculum mapping responded positively. Sixty-seven percent of the teachers with more than five hours of training in curriculum mapping responded positively. Pearson's Chi-square test result for knowledge vs. training was 1.9171.

Table 6

Pearson's Chi-square test data of Knowledge vs. Training

	Knowledge vs. Training	
Response	5 hours or less	More than 5 hours
Negative Response	0	1
Neutral Response	7	3
Positive Response	12	8
Pearson ChiTest Result =	1.9171	

The fourth independent variable that was tested against knowledge was the number of grade levels in the classroom. When teachers were grouped according to grade levels in the

classroom, the answers from four of the subjects were removed because they taught in departmentalized situations. Therefore, each time the dependent variables were measured against the independent variable of number of grades in the classroom, the total number of subjects was twenty-seven. Thirty-six percent of teachers in single grade classrooms responded positively. Seventy-five percent of the teachers in multi-grade classrooms responded positively. Pearson's Chi-square test result for knowledge vs. training was 4.6330.

Table 7

Pearson's Chi-square test data of Knowledge vs. Number of grade levels in the classroom

	Knowledge vs. The number of grade levels in the classroom	
Response	Single Grade	Multi-Grade
Negative Response	1	0
Neutral Response	6	4
Positive Response	4	12
Pearson ChiTest Result =	4.6330	

Attitude

The second dependent variable is a teacher's attitude about curriculum and curriculum mapping. Tables 8 through 11 show the types of responses given by the two groups in each of the teachers' characteristics of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom. Twenty-two teachers gave positive responses to questions designed to measure their attitude toward curriculum and curriculum mapping.

The first independent variable that was tested against attitude was sex. Seventy-five percent of males responded positively. Sixty-eight percent of females responded positively. Pearson's Chi-square test result for attitude vs. sex was 1.3588.

Table 8

Pearson's Chi-square test data of Attitude vs. Sex

	Attitude vs. Sex	
Response	Male	Female
Negative Response	0	2
Neutral Response	3	4
Positive Response	9	13
Pearson ChiTest Result =	1.3588	

The second independent variable that was tested against attitude was the number of years of teaching experience. Sixty-four percent of teachers with ten years or less of teaching experience responded positively. Seventy-six percent of teachers with more than ten years of teaching experience responded positively. Pearson's Chi-square test result for attitude vs. experience was 3.7579.

Table 9

Pearson's Chi-square test data of Attitude vs. Experience

	Attitude vs. Experience	
Response	10 years or less	More than 10 years
Negative Response	0	2
Neutral Response	5	2
Positive Response	9	13
Pearson ChiTest Result =	3.7579	

The third independent variable that was tested against attitude was the number of hours of training in curriculum mapping. Seventy-four percent of teachers with five hours or less training in curriculum mapping responded positively. Sixty-seven percent of teachers with more than five hours of training in curriculum mapping responded positively. Pearson's Chi-square test result for attitude vs. training was 3.5210.

Table 10

Pearson's Chi-square test data of Attitude vs. Training

	Attitude vs. Training	
Response	5 hours or less	More than 5 hours
Negative Response	0	2
Neutral Response	5	2
Positive Response	14	8
Pearson ChiTest Result =	3.5210	

The fourth independent variable that was tested against attitude was the number of grades in the classroom. Forty-five percent of teachers in single-grade classrooms responded positively.

Eighty-eight percent of teachers in multi-grade classrooms responded positively. Pearson's Chi-square test result for attitude vs. training was 6.2171.

Table 11

Pearson's Chi-square test data of Attitude vs. Number of grade levels in the classroom

	Attitude vs. The number of grade levels in the classroom	
Response	Single Grade	Multi-Grade
Negative Response	2	0
Neutral Response	4	2
Positive Response	5	14
Pearson ChiTest Result =	6.2171	

Behavior

The third dependent variable is a teacher's behavior about curriculum and curriculum mapping. Tables 12 through 15 show the types of responses given by the two groups in each of the teachers' characteristics of sex, years of teaching experience, number of hours of training in curriculum mapping, and the number of grade levels in a classroom. Twenty-three teachers responded positively to questions about their behaviors having to do with curriculum and curriculum mapping.

The first independent variable that was tested against behavior was sex. Seventy-five percent of males responded positively. Seventy-four percent of females responded positively. Pearson's Chi-square test result for behavior vs. sex was 1.5872.

Table 12

Pearson's Chi-square test data of Behavior vs. Sex

	Behavior vs.Sex	
Response	Male	Female
Negative Response	0	2
Neutral Response	3	3
Positive Response	9	14
Pearson ChiTest Result =	1.5872	

The second independent variable that was tested against behavior was the number of years of teaching experience. Seventy-one percent of teachers with ten years or less experience responded positively. Seventy-six percent of teachers with more than ten years teaching experience responded positively. Pearson's Chi-square test result for behavior vs. experience was 2.7938.

Table 13

Pearson's Chi-square test data of Behavior vs.Experience

	Behavior vs. Experience	
Response	10 years or Less	More than 10 years
Negative Response	0	2
Neutral Response	4	2
Positive Response	10	13
Pearson ChiTest Result =	2.7938	

The third independent variable that was tested against behavior was the number of hours of training in curriculum mapping. Seventy-nine percent of teachers with five hours or less

training in curriculum mapping responded positively. Sixty-seven percent of teachers with more than five hours of training in curriculum mapping responded positively. Pearson's Chi-square test result for attitude vs. training was 3.3893.

Table 14

Pearson's Chi-square test data of Behavior vs. Training

	Behavior vs. Training	
Response	5 hours or less	More than 5 hours
Negative Response	0	2
Neutral Response	4	2
Positive Response	15	8
Pearson ChiTest Result =	3.3893	

The fourth independent variable that was tested against behavior was the number of grade levels in the classroom. Fifty-four percent of teachers in single grade classrooms responded positively. Eighty-eight percent of teachers in multi-grade classrooms responded positively. Pearson's Chi-square test result for attitude vs. training was 4.6330.

Table 15

Pearson's Chi-square test data of Behavior vs. Number of grade levels in the classroom

	Behavior vs. The number of grade levels in the classroom	
Response	Single Grade	Multi-Grade
Negative Response	2	0
Neutral Response	3	2
Positive Response	6	14
Pearson ChiTest Result =	4.6330	

Summary

Table 16 below shows the Pearson Chi-square test results from Tables 4 through 15 above.

Table 16

Summary of complex Pearson's Chi-square test results.

Independent Variable Categories	Dependent Variable Categories		
	Knowledge	Attitude	Behavior
Sex	3.18	1.36	1.59
Years of Teaching Experience	1.92	3.52	3.39
Hours of Training in Curriculum Mapping	1.12	3.76	2.79
Number of Grade Levels in the Classroom	4.63	6.22	4.63

The null hypothesis was supported for all of the independent variables for Knowledge and Behavior. It was also supported for three of the independent variables (sex, years of teaching experience, and hours of training in curriculum mapping) for Attitude.

Pearson's Chi-square test result for "Attitude" vs. "Number of grades in the classroom" was 6.22. With 2 degrees of freedom (*df*) a Pearson's Chi-square of six or greater indicates 95% ($p < 0.05$) confidence that there is a significant difference between the two groups.

CHAPTER V: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

There was an assumption that there would be a correlation between sex, experience, the number of grade levels in a classroom, and the length of training in curriculum mapping and a teacher's knowledge, attitude, and behavior toward curriculum mapping. The questions on the survey were designed to measure whether these variables did have an effect.

The data was divided into two groups respective to the four variable categories. In the category of sex, the data was divided into the groups of male and female. In the category of training, the data was divided into the groups of teachers who were trained in curriculum mapping for five hours or less and those who were trained for more than five hours. In the category of experience, the data was divided into the groups of teachers with ten years experience or less and more than ten years of experience. Finally, the category of number of grades in the classroom was divided into teachers who taught in single-grade classrooms and teachers who taught in multi-grade classrooms.

A Pearson's Chi-square test with two degrees of freedom having a result of 6.0 or greater indicates that there is a 95% (p<0.05) degree of confidence that there is a significant difference between the independent variable being tested and the corresponding dependent variable. In this study, twelve standard Pearson's Chi-square tests are listed in Table 16 in Chapter IV. Of the twelve tests that were conducted, only one Pearson's Chi-square test result was greater than six. In Table 10, Attitude vs. Number of grades in the classroom, the Pearson's Chi-square was 6.2171, indicating that there is a 95% (p<0.05) confidence that there is a significant difference between the attitudes of teachers who have single grade classrooms and those who have multi-grade classrooms toward curriculum mapping.

Fourteen of the sixteen (87.5%) teachers in multi-grade classrooms gave positive responses, while only five of eleven (45.5%) single grade teachers gave positive responses about their attitudes. Perhaps multi-grade teachers have a greater ability to see the benefits associated with knowing the curriculum that is taught in consecutive grades because they are teaching more than one grade level. Single grade teachers may have a more difficult time seeing those benefits.

The Pearson's Chi-square test for Attitude vs. Type of classroom demonstrated with a 95% ($p<.05$) probability that there is a significant difference between one of the independent variables and one of the dependent variables being studied. Therefore, the null hypothesis that there is no difference should be rejected.

Recommendations

When teachers are asked to use new tools or to try new processes to improve education, there are almost always road blocks which may inhibit those ideas from being successful. In this study a correlation was found to exist between the number of grade levels in the classroom and the teacher's attitude toward curriculum mapping. Principals and curriculum leaders in WELS schools should be cognizant of the fact that this correlation can affect the teachers. With the knowledge that the number of grade levels in a classroom makes a difference, the administrators can plan the implementation of curriculum mapping to be as effective and efficient as possible.

There are several things that administrators can do to increase the probability that curriculum mapping can be implemented successfully. Principals and curriculum leaders may carefully consider the factors related to the teachers on their staff in order to successfully implement curriculum mapping. They may make adjustments to the amount and kind of training. They may also determine what kind of encouragement will be needed to assist the teachers in their efforts to make curriculum mapping work for them. Understanding which factors related to

the teachers on staff have may help the leaders to decide how much freedom and independence in the process can be granted to the different teachers on their staff.

A qualitative follow-up study could help to determine how curriculum mapping is actually carried out in each school. The complete process of curriculum mapping includes not only recording the curriculum that was taught, but it also includes having the teachers review the maps of the other teachers in the school. The purpose of this review is to help teachers to discover redundancies in the curriculum. It also helps to eliminate gaps in what is being taught. The degree to which an entire teaching staff completes these important phases of the curriculum mapping process could affect how the process is perceived and how effective it is in improving instruction.

This study included thirty-one teachers from schools that have done curriculum mapping for at least two years. The study could be expanded to include more teachers. With more teachers in the study, the results could be considered more representative of the entire population of WELS teachers. The study could also be expanded to include non-WELS teachers to determine if WELS teachers are unique in how these variables affect their knowledge, attitude, and behavior toward curriculum mapping.

Another study could be developed to compare teachers who have done curriculum mapping to those who have not done curriculum mapping, or the study could compare the student performance or achievement of schools where curriculum mapping is practiced to students in schools where the teachers do not map the curriculum.

The real measure of success for any educational tool or process is whether or not it has a positive impact on student achievement. Additional studies could be done to evaluate the effect curriculum mapping on student achievement.

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Appendix A

Curriculum Questionnaire

Curriculum Research Study
Dan Markgraf, MLC Graduate Capstone Project

Demographic Information

Years of total teaching experience _____

Sex: M F

Age: _____

College (or graduate) credits earned during the last five years: _____

Are you teaching in (circle one):

Single grade classroom Multi-grade classroom Departmentalized

If multi-grade, how many grades in your classroom?2 3 4 5 6

Have you been trained in the use of curriculum mapping by a certified trainer?

Yes No

Have you been trained in the use of curriculum mapping by a non-certified faculty member?

Yes No

How much formal training in curriculum mapping have you had?

____ 0 hours _____ 1 hour _____ 2-5 hours _____6 hours or more

Some of the questions on this survey will ask you to reflect on the content of your classroom curriculum before you did curriculum mapping. Please try to be as accurate as possible in remembering the teacher you were at that time in your ministry.

Please read the statement and decide on the degree to which you agree with it. Circle the number which indicates your level of agreement.

(1=strongly disagree, 2=disagree, 3=uncertain, 4=agree, and 5=strongly agree)

1. After using curriculum mapping teachers have more input into making changes to the school's curriculum than they did before using curriculum mapping.

1 2 3 4 5

2. Curriculum mapping has given teachers more opportunities or knowledge to make informed decisions regarding curriculum.

1 2 3 4 5

3. Curriculum mapping has helped me prepare my classroom curriculum so that it better focuses on the Scriptural perspective.

1 2 3 4 5

4. In the area(s) of the curriculum that have been mapped, I know what is taught by the teacher(s) in the grade level(s) below mine.

1 2 3 4 5

5. In the area(s) of the curriculum that have been mapped, I know what is taught by the teacher(s) in the grade level(s) above mine.

1 2 3 4 5

6. I have made changes to my curriculum as a result of curriculum mapping.

1 2 3 4 5

7. Curriculum mapping has given me more confidence to eliminate portions of curriculum and textbook information.

1 2 3 4 5

8. Curriculum mapping has clarified my expectations of the students in my classroom.

1 2 3 4 5

9. Curriculum mapping has been worth the time and effort.

1 2 3 4 5

Please compare the situation before you did curriculum mapping with the situation in your classroom after doing curriculum mapping. For these items, circle "Less", "About the Same", or "More".

10. After my experience with curriculum mapping, my familiarity with what is taught by the teacher(s) in the grade level(s) below mine is:

Less About the Same More Does not apply

11. After my experience with curriculum mapping, my familiarity with what is taught by the teacher(s) in the grade level(s) above mine is:

Less About the Same More Does not apply

12. After my experience with curriculum mapping, my confidence to eliminate portions of the curriculum and textbook information is _____ than before using curriculum mapping.

Less About the Same More

13. After my experience with curriculum mapping, discussion among teachers about curriculum content of different grade levels has been _____ than before using curriculum mapping.

Less About the Same More

14. After my experience with curriculum mapping, the frequency of spending time in faculty meetings discussing curriculum is _____ than before using curriculum mapping.

Less About the Same More

15. After my experience with curriculum mapping, my consideration of state standards while preparing my curriculum is _____ than it was before using curriculum mapping.

Less About the same More

16. After my experience with curriculum mapping, the frequency of spending time informally discussing curriculum is _____ than before using curriculum mapping.

Less About the Same More

17. If your school uses curriculum mapping software, how comfortable are you in using it?

Very Uncomfortable Somewhat comfortable Very comfortable