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DEVELOPMENT AND EVALUATION OF A MENTORING
FRAMEWORK FOR TECHNOLOGY & ENGINEERING
TEACHERS IN ALPINE SCHOOL DISTRICT

by

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A Plan B project submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Technology and Engineering Education

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TABLE OF CONTENTS

	Page
LIST OF TABLES	iii
ACKNOWLEDGMENTS	iv
Chapter 1: INTRODUCTION.....	1
A New Adventure	1
Education in the News	2
Statement of the Problem.....	3
Statement of Purpose	3
Statement of Need.....	4
Statement of Assumptions	5
Statement of Limitations.....	6
Procedure	6
Definitions of Terms & Acronyms	7
Chapter 2: REVIEW OF LITERATURE	8
Teacher Attrition.....	8
Career and Technical Education	10
Technology and Engineering Education.....	11
Mentoring in CTE Nationally	11
Trends in Utah.....	14
Trends in Alpine School District	15
Summary of Review of Literature	20
Chapter 3: METHODOLOGY	21
The Researcher.....	21
Implementation of Mentoring Framework.....	22
Chapter 4: FINDINGS	25
Comment and Quotes from New Teachers.....	26
Chapter 5: CONCLUSION & RECOMMENDATIONS	28
Items that were changed.....	29
Recommendations.....	30
REFERENCES	33
APPENDICES	36
Appendix A CTE Mentoring Framework.....	37

LIST OF TABLES

Table	Page
1. List of Relevant Findings from Mordan’s Dissertation	13
2. Teacher Movement in Alpine School District	16

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CHAPTER 1

INTRODUCTION:

A New Adventure

It's the beginning of a new school year. Administrators are preparing teacher trainings and best procedures and policies for their students. Thoughtful counselors methodically plan the right schedule so students can have the most success. The group with the most excitement might just be the students. Who will be in your class? Who will be your new teacher? What will your classroom be decorated like? Do you have all of the needed supplies? Then we come to the last group: the teachers. For the teachers, there is also a lot of excitement within this group accompanied by some worry and apprehension. For the veteran teachers, there is excitement, to start over with new kids and the new opportunities to learn and teach. New teachers finally get to do what they have been studying and preparing for the past few years. Their name is on the door. The new teachers are responsible for these kids. Are they ready for this? Do these new teachers have the right lesson plans? Do they have enough teaching skills to pull this off?

This scenario illustrates the need for and benefit of new teacher mentoring programs. Mentoring programs are designed to help reassure and enable new teachers that they can be successful. Mentors visit new teachers, giving help and aid wherever possible. Often this aid comes in the form of collaboration and the sharing of experience. Mentors share ideas on classroom organization, classroom management, lesson delivery method, interaction with parents, and what lessons to teach. Beyond collaboration, mentors observe how new teachers' lessons are taught to provide positive feedback and constructive criticism.

Education in the News

Education is a common topic in the news today. Some of the news is positive and some is negative. News stories focus on such topics as: overcrowding and danger in schools, teacher salaries, scarcity of teachers, and most recently, the discussion of state vs. national curriculum. These news stories highlight the difficulty to organize and run an effective school with highly qualified teachers. These problems are more than just news stories they are real issues. At the heart of these issues lies the need to staff each school with highly qualified teachers. The process for teachers to become “highly qualified,” is arduous and requires ongoing professional development, background checks, participation in multiple online trainings, several fees and attendance at workshops and conferences to continue their education, all in addition to their everyday teaching in the classroom. The continued time investment and the expectation to continually improve can lead to an unhealthy level of stress. Additionally, often overlooked stress factors include lack of parental involvement, constantly changing class standards, poverty, and absenteeism.

As curriculum, standards, and equipment change, it becomes increasingly difficult for Technology and Engineering Education (TEE) teachers to keep their skills current and their curriculum relevant. Although many teachers who teach in the department of Career and Technical Education (CTE), of which TEE is a part, feel that the constant changes in technology are a positive, they also recognize that these constant changes make their job difficult. In the past few years, alone, new technologies like laser engravers, 3D printers, upcut saws, CNC mills, and quadcopters have been brought into schools within the

Alpine School District (ASD). New teachers understandably begin to feel overwhelmed by all the new technologies and leave the profession.

In addition to the struggle with new technologies, many TEE teachers are unsatisfied with their compensation. Historically, a majority of TEE teachers are men; many are sole providers in their homes, and their families cannot survive on the lower salary of a new teacher. TEE teachers have a valuable skillset useful to industry, and since they cannot afford to stay and teach, they leave and pursue employment outside of education. In chapter two, the researcher will expound on the many reasons and factors that lead to teachers, specifically TEE teachers, leaving the classroom.

Statement of the Problem

There is no effective mentoring framework set up in the Alpine School District focusing on middle school Technology and Engineering Education teachers. A mentoring framework will help the Alpine School District retain its middle school Technology and Engineering Education teachers.

Statement of the Purpose

One of the major problems impacting the public education system is the early departure of new teachers from the teaching profession. The quality of teachers is recognized as the most powerful school-related determinant of student success...many education leaders have begun to invest in new-teacher mentoring (Barlin, 2010, p. 1). The purpose of this project is to develop and pilot a formal mentoring program for new

teachers in the content area of middle school Technology and Engineering Education in Utah's Alpine School District. Specifically, this mentoring program will include:

- A monthly schedule of topics and helpful ideas for new middle school TEE teachers, to be covered by the mentor.
- An outline of questions designed to improve new middle school TEE teacher's instruction, to be asked by the mentor.

Statement of Need

Teachers, especially new teachers, are overwhelmed by all that is expected and required of them. The Utah State Office of Education (USOE) is responsible for the writing and implementation of standards in education for schools in the state of Utah. The USOE is not responsible for the training or mentoring of teachers. The responsibility for training and mentoring these teachers is left to the individual school districts. Occasionally that responsibility is delegated to the individual schools, but is often overlooked or forgotten all together. Other districts or schools may not have effective mentors because they do not have a very good structure in place to conduct the needed mentoring. This lack of mentoring or the need to provide monetary support, motivates many teachers to prematurely leave the teaching profession to search for a better work experience elsewhere.

According to Dr. R. M. Ingersoll (2003), a nationally recognized researcher in the area of teacher retention, many new teachers prematurely leave the profession. In a well-known study, Ingersoll found that anywhere between 40 and 50 percent of new teachers leave the classroom within their first five years (p. 13). Conversely, a more recent study

by Gray and Taie, 2015, claims the numbers are closer to 20% of teachers leaving education within the first five years.

A possible explanation for the discrepancies in numbers could be the dates that the two studies were conducted. Ingersoll's study was conducted from 1988-2001. Gray and Taie's study was conducted 2007-2012. The time period of Ingersoll's study, the national economy was in a time of expansion and of great economic prosperity. Jobs, especially teaching jobs were not hard to come by. On the contrary, during the time period of Gray and Taie's study the national economy was struck by the great recession. This was a time of rampant job loss and economic uncertainty. People were not willing to leave their jobs. This conflicting data gives more support for the need of mentoring. Gray and Taie (2015) did find that 28% of those teachers who did leave during their first five years were not mentored, (p. 6, Table 2).

The proposed mentoring framework is designed to help new middle school TEE teachers in the Alpine School District feel supported, to minimize the feeling of being overwhelmed, and to help develop and improve teaching and classroom management skills. By so doing, the framework will enable new middle school TEE teachers to become effective and "highly qualified".

Statement of Assumptions

Teachers gave full disclosure when discussing reflection of the mentoring framework.

Statement of Limitations

The following limitations were inherent in this project:

1. This project was only administered to Alpine School District middle school teachers.
2. The mentoring framework was only used to mentor middle school Technology and Engineering Education teachers.
3. Only 1st and 2nd year teachers were asked to participate.

Procedure

The following steps were completed in the pursuit of this project:

1. Recognized/Identified the problem.
2. Decided on methods.
3. Developed a Mentoring Framework. (See Appendix A)
4. Conducted mentoring visits with new Technology and Engineering Education teachers.
5. Distributed Mentoring Framework to other middle school Technology and Engineering Education teachers for revisions and feedback on effectiveness.
6. Continued to make mentoring visits with new teachers.
7. Formulated conclusion.

Definition of Terms

1. Differentiated Learning - teachers differing their instruction to meet the different learning styles of their students: auditory learners, visual learners, tactile learners and kinesthetic learners.
2. Contextual Factors - factors or statistics that affect the way a teacher teaches or the way a classroom is managed.
3. Middle School – includes all school names including Middle School, Intermediate School, and Junior High School. Traditionally grades 6-9 are included in this classification.

Acronyms

1. CTE - Career and Technical Education
2. USOE - Utah State Office of Education
3. TEE - Technology and Engineering Education
4. ACTE - Association for Career and Technical Education
5. ASD - Alpine School District
6. NCES - National Center for Educational Statistics
7. NAEP - National Assessment Educational Progress

CHAPTER 2

REVIEW OF LITERATURE:

Teacher Attrition

Teachers often leave schools, they are classified as leavers—those who leave the teaching occupation altogether. Another classification is movers—those who move to teaching jobs in other schools. The annual turnover rate of both of these groups increased to 15.7% in 2001 (Ingersoll, 2003, p. 9). According to Gray and Taie (2015), there is a third classification that should be included in this discussion—returners, those who were in the current year of data but not in the previous year, excluding new teachers (p. 2).

The following list gives some reasons of why teachers leave the classroom:

1. Burnout
2. Resilience
3. Age & Gender
4. Race & Ethnicity
5. Family make up (Schaefer, 2012, p. 110)

Listed below are contextual factors or contributing factors of why teachers leave. This list describes some of the feelings that were expressed when the reasons above were given.

1. Salary
2. Availability of appropriate profession development
3. Collaboration
4. The nature of context
5. Student issues
6. Teacher education (Schaefer, 2012, p. 110)

Another study provides the following list of reasons for job dissatisfaction in the teaching profession:

1. Low salaries
2. Lack of support from the school administration
3. Poor student motivation/discipline problems
4. Lack of teacher influence over decision-making, (Ingersoll, 2003, p. 16).

These studies contain commonalities which are suggested to lead teachers to become movers or leavers. The commonalities are: salaries and issues with students. One would believe that retirement would also be a leading factor contributing to teachers leaving. However, the retirement numbers are actually lower: 20% for retirees and 25% for movers or leavers, (Ingersoll, 2003, p. 16).

In April 2015, the National Center for Educational Statistics, (NCES) reported the results of the study conducted by Gray and Taie. The results calculated a teacher turnover rate of 30 percent after five years as compared to Ingersoll's results of 40-50 percent of teachers leaving in their first five years. Gray and Taie's numbers were lower than expected. One possible theory is that the study followed new teachers who began teaching in 2007-08, just as the recession hit and jobs were about to become extremely scarce.

Ingersoll and Perda (2012), discuss job turnover in other occupational fields.

All organizations and occupations experience some loss of new entrants—either voluntarily because newcomers decide to not remain or involuntarily because employers deem them unsuitable. Moreover, some degree of employee turnover, job, and career change is normal, inevitable, and beneficial. However, teaching has relatively high turnover compared to many other occupations and professions, such as lawyers, engineers, architects, professors, pharmacists and nurses, and these departures are not cost free (¶11).

Career and Technical Education

Career and Technical Education (CTE) is a category of classes available to middle school, junior high and high school students nationwide. The classes which are available range from career explorations with many small experiences within a variety of careers. From a simple lab experience, to an internship where the student will be working on the job site and getting real hands on education. According to ACTEonline.org, CTE serves 94 percent of all high school students. Also, the average high school graduation rate for students concentrating in CTE programs is 93 percent, compared to an average national graduation rate of 80 percent (ACTEonline, 2015).

Natasha Deflorian (2016) explains the purpose and benefits of CTE as, “Helping students connect their passion with the purpose... CTE programs are uniquely positioned to facilitate this connection” (p. 25). CTE classes have the broadest range of classes of any subject area. When most people think of CTE classes, they think of woodworking, sewing or auto mechanics, however, the following is a list of focus areas within CTE:

1. Agricultural Education
2. Business and Marketing Education
3. Family Consumer Sciences Education
4. Health Science Education
5. Information Technology Education
6. Skilled and Technical Education
7. Technology and Engineering Education

Technology and Engineering Education

Technology and Engineering Education (TEE) is the last area of focus listed above. William E. Warner, (1947) one of the founding fathers of the TEE movement, notably believed:

Primitive man developed the handicrafts to supply his limited needs of self-preservation. The Renaissance of the 14-16th Century brought a wave of invention and the dawn of industry, which is still being launched in underdeveloped areas. Today's economy has become technological and the resulting problems of productivity and consumption, not to mention the social adjustments involved, have become literally cataclysmic (p. 3).

Warner later went onto to almost perfectly describe most of the standards by which many of today's technology and engineering classes are based upon, "Power and transportation, manufacturing, construction, communications, and personal management (Warner, 1947, p. 6). Today, personal management is not part of TEE but is taught by the business and finance teachers. One standard typically included in TEE that Warner did not specifically mention is design. This is a key element of the engineering process as stated by Benenson (2008):

Incorporating design education in technology can provide a framework for education, which focuses less on getting the right answer, and more on how to get from existing situations to desired ones. At the same time, technology education can contribute project based, experiential pedagogies that are largely missing from engineering education (p. 206).

Mentoring in CTE Nationally

There are many studies that have been done on teacher attrition and movement of teachers in the general field of education. There are not many studies that have been done specifically on the area of CTE. Ben Mordan (2012), a PhD candidate wrote his dissertation on the retention and mentoring of beginning CTE teachers. His study

consisted of 110 CTE teachers in their first five years of teaching 9th-12th grade in public education during 2007-2008 school year. His findings stated that 16.1% of the beginning CTE teachers left the teaching profession after their first year (p. 140). He also found that new CTE teachers were 6.64 times more likely to remain in teaching if they had been assigned a mentor. Mordan discovered that mentoring is important but frequent mentoring is even better (Mordan, 2012, p. 141).

Listed below in Table 1, there are four research questions that Mordan examines in the mentoring visits with the first year teachers. If new teachers begin to feel alone or unsupported, they often begin to feel overwhelmed and burdened with too many items to accomplish. New teachers may question if they can even continue in the profession. However, frequent visits by a mentor can resolve concerns, help the new teachers to feel supported and, therefore, they continue teaching.

Table 1

List of Relevant Findings from Mordan's Dissertation

Research Question:	Stated Findings:	Reference Page #
How frequently did you work with your mentor teacher during the 07–08 school year?	Beginning CTE teachers indicating that they had worked with their mentor, were 6.60 times more likely to remain in teaching than beginning CTE teachers responding that they never worked with their assigned mentor.	pp. 91-92
How frequently did your assigned mentor teacher work with you in the area of classroom management and discipline?	Beginning CTE teachers indicating that they had worked with their mentor in the area of classroom management and discipline were 7.06 times more likely to remain in teaching than beginning CTE teachers responding that they had not worked with their mentor in this area.	pp. 95-96
How frequently did your assigned mentor teacher work with you in the area of using technology in your classroom?	Beginning CTE teachers indicating that they had worked with their mentor in the area of using technology in their classroom were 8.13 times more likely to remain in teaching than beginning CTE teachers responding that they had not worked with their mentor in this area.	pp. 97-98
How frequently did your assigned mentor teacher work with you in the area of interacting with parents?	Beginning CTE teachers indicating that they had worked with their mentor in the area of interacting with parents were 7.44 times more likely to remain in teaching than beginning CTE teachers responding that they had not worked with their mentor in this area.	pp. 101-102

Information in Table 1, gathered from Mordan, 2012 pp. 91-102.

Trends in Utah

The population of Utah is growing at a rapid rate. The Census of 2000 showed that Utah had 2,233,169 people who called Utah home (US Census, 2000). The next Census was completed in 2010. There were 2,995,919 who then called Utah home (US Census, 2010). This growth in population has led to an increased need for teachers. There is concern that there will be not enough new teachers to fill the necessary teaching positions to match the population growth and to compensate for teachers who are leaving the profession due to retirement or a change in profession. Another concern is whether the new teachers are qualified to fill those teaching positions. Misconceptions regarding the teaching profession exist such as: those that cannot do, teach; people were only accepted into a major university because they went into teaching; or if you were really good at what you teach you would get a real job in the industry.

Tami Pyfer, a former Logan City Councilwoman and a former member of the Utah State Board of Education, who now is the Education Advisor to Governor Gary Herbert, stated: “We have all of these periphery problems that our teachers aren’t good enough, or we’re not getting the best and the brightest, while actually we are.” Pyfer later said, “Our job is to support what is happening in these schools, the discoveries that are happening (Pikes, 2015, ¶ 6).

Recently in a Deseret News article, Morgan Jacobsen wrote of the plight of a new teacher and his struggles that ultimately lead to his departure from the teaching field. Jacobsen sites data from the Utah State Office of Education that, “In Utah, 42 percent of new teachers quit within five years of starting, and more than one-third of those who leave the profession do so at the end of their first year (2016, p. 2). Jacobsen went onto

address the growth of our schools, “Last year the schools gained almost 12,000 new students, total student count of 633,896 students in the state. That’s almost 110,000 students more than in 2006” (2016, p. 2).

Trends in Alpine School District

The Alpine School District (ASD) is the 43rd largest school district in America and the largest school district in Utah. ASD is located in north Utah County and as of October 1, 2015 served 73,273 students (USOE, 2015 a). ASD is generally made up of suburban neighborhoods. ASD has experienced a tremendous amount of growth in the past 12 years. The actual numbers gathered from USOE, ASD had 51,118 in 2003 and increased to 73,273 in 2015, (2015 b). ASD employs 26 middle school TEE teachers. Many districts might employ two up to 6 or 10 TEE teachers. Within ASD, there is significant turn over in teachers. The researcher has gathered information regarding middle school TEE teachers leaving schools and/or switching schools over the past 12 years in ASD. The actual movement and the reasons for the movement have been compiled into Table 2.

Table 2

Middle School TEE Teacher Movement in Alpine School District

School	Movement of TEE teachers	TEE Teachers since 2003	TEE Teaching Positions at the School
American Fork Jr. High	Teacher 1 started teaching Fall 2003, and transferred to Willowcreek (ASD) Fall 2008. Teacher 2 retired Spring 2009. Teacher 3 started Fall 2009 and left Spring 2015 for an administrative position. Teacher 4 started Fall 2009 and left Feb 2012. Teacher 5 taught the remainder of the year until Spring 2012 (only a four month contract). Teacher 6 started Fall 2012 and left Spring 2014 (spouse took a job out of the area). Teacher 7 started Fall 2014. Teacher 8 started Fall 2015.	9	3
Canyon View Jr. High	No change since 2003	1	1
Frontier Middle	Teacher 1 and Teacher 9 opened this school Fall 2013. Teacher 10 started Fall 2015.	3	3
Lakeridge Jr. High	Teacher 11 started Fall 2006, transferred to a high school (ASD) Spring 2010. Teacher 12 started Fall 2010 and transferred to a high school (ASD) Spring 2013.	3	2
Lehi Jr. High	Teacher 13 retired Spring 2009. Teacher 14 started Fall 2009	3	2
Mountain Ridge Jr. High	Teacher 15 started Fall 2006. Teacher 16 retired Spring 2008. Teacher 17 started part time 2010.	3	2
Oak Canyon Jr. High	No change since 2003	2	2
Orem Jr. High	No change since 2003	1	1
Pleasant Grove Jr. High	Teacher 18 started Fall 2003 and left to teach in another state Spring 2010. Teacher 19 started Fall 2010 and transferred to a high school (ASD) Spring 2012. Teacher 18 came back for 1 year then left for an administrative position in 2013. Teacher 20 started Fall 2013.	4	2
Timberline	Teacher 21 opened new school Fall 2003.	2	2

Middle	Teacher 22 started in Fall 2005.		
Vista Heights Middle	Teacher 9 and Teacher 23 opened new school Fall 2010. Teacher 24 started Fall 2011 then left to be a stay at home parent Spring 2012. Teacher 25 started Fall 2012. Teacher 9 transferred to open Frontier (ASD) Spring 2013. Teacher 23 left to pursue PhD Spring 2013. Teacher 11 started Fall 2013 and left to pursue PhD Spring 2014. Teacher 26 started Fall 2014. Teacher 27 started Fall 2014.	7	3
Willowcreek Middle	Teacher 9 opened new school Fall 2004. Teacher 1 transferred Fall 2008. Teacher 9 transferred to open Vista Heights (ASD) Spring 2010. Teacher 26 started Fall 2010, Teacher 1 transferred to open Frontier (ASD) Spring 2013. Teacher 28 started Fall 2013. Teacher 26 transferred to Vista Heights (ASD) Spring 2014. Teacher 29 started Fall 2014.	5	2

The information contained in Table 2 states the following data: There were a total of 43 middle school TEE teachers in ASD since 2003. Out of these 43 teachers 7 have left in their first five years of teaching. This data shows that 16% of those 43 teachers have left in their first five years. This is lower than the national average. However, a more precise and discouraging number would be, out of those 43 teachers there were only 13 teachers in their first five years or less. Seven of the 13 new teachers leaving would be 53% leaving in their first five years or less.

Is ASD having higher percentage of middle school TEE teachers leave the classrooms compared to the national averages? The average in Ingersoll's study was 45%. The average in Gray and Taei's study was 25%. The average in this study was 53%.

This number is taking into consideration only the first through fifth year teachers and calculating the number of those who have left ASD in their first five years of teaching. In

the last two years, ASD has not had any TEE teacher leave education. None of the teachers who participated in this study have left their school or teaching.

As the data was collected for this table, questions were asked to the teachers: Why did you leave? What were the reasons that caused you to choose this route? The answers are listed to the side.

Teacher 2, retired, reasoning was taught for 30 + years

Teacher 3, left to Administration, reasoning was increased salary

Teacher 4*, left for a Coaching position, reasoning was to return to home

Teacher 5*, was only given a four-month contract, reasoning was not hired back

Teacher 6*, left because spouse took a better job out of the area

Teacher 11*, left to pursue PhD, reasoning was increased salary

Teacher 12*, left to a High School position

Teacher 13, retired, reasoning was taught for 30 + years

Teacher 16, retired, reasoning was taught for 30 + years

Teacher 18, left to Administration, reasoning was increased salary

Teacher 23*, left to pursue PhD, reasoning was increased salary

Teacher 24*, left to be a stay at home parent

*Those teachers who left teaching after five years or less.

Data from Table 2 shows the top three reasons given for leaving ASD:

1. Increased salary—First through fifth years of experience.
2. Retirement—30+ years of experience.
3. Family needs—First through fifth years of experience.

As the data is studied from above, the two most common reasons for leaving the middle school TEE classrooms are retirement and increased salary.

ASD has some demographics that are unique. The median age in ASD is 23.6, (Proximity One, 2010). This is the third youngest population for a school district in Utah behind Provo School District (with Brigham Young University) and Logan School District (with Utah State University). This data depicts ASD will continue to grow. In 2003, ASD had 51,118 students, (Hansen, 2010, p. 3). In 2015, ASD had 73,273 students (USOE, 2015). District expansion is the main reason for all of the changes in teachers (movers). In the same time period, ASD has opened four new middle schools and one new high school, another high school will open Fall 2016. There are future plans to open two more middle schools and one possibly two more high schools in the next four to six years.

ASD recognizes the need to retain their teachers in all areas due to the significant and constant growth within the district. Because we are losing too many teachers, ASD has chosen to implement a mentoring program to retain and strengthen their new middle TEE teachers. ASD has demonstrated support of their middle school TEE teachers with needed supplies and equipment, trainings, and great work environments. ASD offers competitive salaries and insurance coverage to their employees. ASD is proactive by improving their teachers instead of reactive with trying to keep their teachers who are leaving. ASD has a reputation of a destination job. There are teachers in Utah who are waiting for the opportunity to transfer into ASD. Adding a mentoring program will improve the quality of teachers and add to the retention levels.

Summary of Review of Literature

This review of literature suggests the need to support new teachers to increase the likelihood of teacher retention. CTE, including TEE specifically, is like many other areas of education that struggle to keep good teachers in the classrooms. Research has shown 16.1% of beginning CTE teachers left the teaching profession after their first year (Mordan, 2012, p. 140). Also included in that same study, Mordan (2012) found that new CTE teachers were 6.64 times more likely to remain in teaching if they had been assigned a mentor (p. 141). This emphasizes the need for an effective mentoring framework. In order to retain new CTE teachers you need quality CTE teachers using an effective mentoring framework with frequent and consistent interaction.

There are many different reasons why teachers choose to leave the field of education. Two common reasons are the need to improve salary and student issues. Effective mentoring programs set up within schools and school districts have proven to be effective in encouraging new teachers to remain in the classroom.

CHAPTER 3

METHODOLOGY:

The purpose of this project was to develop and implement a mentoring framework used in the middle school TEE area of the CTE department of ASD. In this project the person serving as the mentor is also the researcher.

The Researcher

The previous educational experiences of the researcher played an instrumental role in the development of the mentoring framework for this Plan B Project. These experiences include teaching TEE in the middle schools for 13 years, mentoring 12 student teachers, mentoring four first year teaching interns, and countless classroom visits from college students majoring in TEE. Through this experience over the past 13 years, the researcher has developed an excellent skill set for teaching TEE (e.g., classroom management, laboratory processes and maintenance, curriculum development, and purchasing needed supplies and equipment).

In addition to teaching experience the researcher has served in leadership roles at the national, state and district levels. These roles included serving on a national committee to assist in the development of a technology and engineering assessment framework sponsored by the National Assessment of Educational Progress (NAEP), re-writing the Technology and Engineering portion for the course, College and Career Awareness, required by all seventh graders in the state of Utah, and serving as the Program Area Specialist, for past four years, in TEE for all secondary schools in the Alpine School District. Both the education and leadership experiences of the researcher

greatly contributed to the researcher's insight and ability to develop the mentoring framework used in this project.

The idea of developing a framework for mentoring new teachers, came from a mentoring guideline that was presented to the researcher early in his career. This guideline was generic and applied to all teachers (e.g., math, English, science). This guideline was very limited from the perspective of a TEE teacher who would teach in a laboratory environment. in the area of a laboratory teacher. This initial guideline lacked appropriate elements to maintain a laboratory. Additional elements were added based on the experiences of the researcher. The idea of an effective mentoring packet had been considered for several years before this implementation. The researcher's need to complete a Plan B Project for his Masters Degree was the catalyst for the development and implementation of this mentoring framework.

Implementation of Mentoring Framework

This project was conducted for two consecutive school years, 2014-2015 and 2015-2016. The first year of the project monthly visits were made to two first year teachers. The second year of the project visits were made quarterly to the original two teachers, now in their second year. In addition, two new first year teachers were added to the project and visited monthly. The Alpine Mentoring Framework (Appendix A) was the guide for discussions. It was beneficial for both the mentor and new teacher to spend some time to review over the framework to prepare for the up coming discussion. The mentoring framework is structured containing both effective-teaching points along with effective-teaching points in the content area of TEE.

Each visit took anywhere from 20 to 90 minutes. This varied upon the amount of time available for the visit and also the topic of discussion. At the top of each monthly sheet there is a question that would allow the mentor and the new teacher to share stories or past experiences so that they might get to know each other on a more personal level. This establishment of a comradery allowed the mentor to understand a where the new teachers were coming from on comments in class or to the mentor. This technique also allowed the mentor the ability to tailor specific constructive comments to help build the new teachers up and not tear them down. For the new teachers, they could understand that the mentor was trying to help them be a better teacher and not just trying to find fault because of dislikes or disagreements. Also when a compliment was made, it could be genuinely taken and not just to make them feel good.

Some of the main topics which were discussed were budgeting, student behavior, ordering supplies, classroom procedures (see Appendix A). Classroom discipline and management are different when you teach in a shop or kitchen verses in a regular classroom full of desks and textbooks. These two topics, classroom discipline, and management, are among the many important teaching skills that can quickly help a new teacher have a positive teaching experience. Throughout the mentoring visits, the new teachers have expressed the desire to develop these two skills quickly.

With each visit to the new teacher's classroom, there was an attempt to observe the new teachers teach a full or at least a part of a class period. Important information was gathered and observed on how the lesson plans could be modified for the specific needs of the students and also how the new teacher's actions could be praised or

corrected. After each meeting it was beneficial for both to write down some reflections on what went well and what could be improved upon.

During each visit the Alpine Mentoring Framework (Appendix A) was discussed month by month. The Framework was used to direct the thoughts of the mentoring process. When time permitted, the mentor would follow up in the middle of the month or even weekly on points that the new teacher was working to strengthen.

During the visits, the new teachers would ask questions about the use of technology. Questions ranged from, “How do I purchase it?” to “Now that I have it, what is the best way to implement it into my class?” even “How do I maintain it?” As discussed earlier in the Introduction, TEE teachers are blessed and cursed with many new items of technology. TEE teachers have a hard time sifting through all of the new items that they could possibly teach in their classes.

Other commonly asked questions dealt with parents and student issues. How do you effectively involve them when you need more help with their student? How do you motivate the unmotivated students? If a student misbehaves in class, what is the best way to communicate with parents? These were all questions discussed during the monthly visits with the new teachers and the mentor.

CHAPTER 4

FINDINGS:

Findings

The purpose of this project was to develop and pilot a formal mentoring program for new teachers in the content area of Technology and Engineering Education at the middle school school in Utah's Alpine School District. Specifically, this mentoring program included:

- A monthly schedule of topics and helpful ideas for new teachers to be covered by mentors.
- An outline of questions designed to improve instruction to be asked by mentors.

The data collected from this project revealed several things about middle school TEE teachers in ASD. From Table 2 (see chapter 2, p. 15), 43 middle school TEE teachers have taught in ASD since 2003. Of those 43 teachers, seven teachers left the middle school TEE classroom after teaching five years or less. Expressed as a percentage, 16% of the 43 middle school teachers in ASD left in their first five years. It is significant to note that this percentage is lower than the national average. However, a more precise and discouraging number is, out of the 43 teachers only 13 teachers were in their first five years of teaching. With seven of the 13 new teachers leaving in their first five years of teaching, a more accurate rate of 53% is revealed. This is higher than the national average. Running contrary to this trend, recent data shows that in the last two years, ASD has not had any new middle school TEE teachers leave the classroom. Similarly, none of the teachers who participated in this study have left their school or

teaching. Additionally, aforementioned seven teachers who left the classroom, two left to become teachers in higher education, specifically in the Technology Education field.

Evolution is a well-known concept in science. In education, we often have an evolution of teachers. Teachers who begin as a classroom teacher often transition out of the classroom into administration or higher education. Many do so for a pay increase, but many make this change to have a greater or more personal impact on the lives of students. One of the seven who left in their first five years chose the administrative route, while another teacher who had taught for six years chose the same. Another avenue for teacher evolution is college professorship. Teachers who choose this route possess similar motivations to leave the middle school classroom as their administrative counterparts: increase in pay and larger impact on the lives of students. Many believe their greatest work is to prepare teachers who will someday teach many students. Two of the seven who left in their first five years chose the professorship route.

Comments and Quotes From New Teachers

In many studies, the individuals who participate are not able to communicate their true feelings. In an effort to combat that, this study has included a few of the thoughts and feelings of some of those who participated. The following example quotes are taken from a teacher questionnaire given to each participant:

“I really enjoyed the mentoring that you did for me and I feel that it helped me get my teaching ability and classroom management (especially in the shop) well tuned.”

“The way that you made the packet helped me know what I needed to know each month, without it being an overload of information.”

“The mentoring packet was brief and concise, which was helpful, because with it being my first year of teaching, it was overwhelming at times.”

“Your visits helped put things in perspective and give me a little more direction on how I wanted to teach my classes.”

“I knew I needed the visits because when you skipped a month, I really missed that extra help.”

“This year I had the opportunity to work with the new Family and Consumer Science Teachers in the Alpine School District. Sometimes it is hard to put your thoughts together in a timely manner. This Mentoring was a fabulous tool to use as I worked with my teachers. It gave us great discussion points and since it was done chronologically it was easy to use throughout the year in a timely manner. I was so grateful to have this tool as I worked with my new teachers. I felt like we were able to cover everything and nothing got left out!!”

“Other mentors should use this packet, it is concise and prescribes what to share with your new teachers. I changed a few things, but that is okay to make it fit my needs.”

From the researchers point of view, such comments help validate the effectiveness of the mentoring framework. Taking into consideration that there is not a specific mentoring framework for middle school TEE teachers in ASD, and also considering the positive feedback from the previously mentored teachers it is presumed that the Alpine Mentoring Framework is an effective mentoring tool. It is also significant that ASD retained all new middle school TEE teachers while this mentoring framework was implemented. The immediate outcome of this project is a positive impact on TEE mentors by providing them an effective tool to use when asked to mentor new TEE teachers. The long-term goal is to have a positive impact on new TEE teachers who will remain in their chosen field, will be successful, and will in turn, be able to make a positive impact on the lives of their students.

CHAPTER 5

CONCLUSION & RECOMMENDATIONS:

Conclusion

The increasing numbers of teachers who are leaving to seek more pay are devastating the classrooms. Cost of living continues to increase. Some find it difficult to survive on two incomes per family. On just one income, it is near impossible. For many teachers this is reality. To survive on a teacher's salary is even more impossible.

“Within the state, average starting salaries range from \$15,704 at the Millard School District to \$46,753 at the Park City School District. Compared nationally, Utah ranked 36th in 2012 for its starting salary of \$33,081, \$3,000 less than the national average, according to the National Education Association” (Jacobsen, 2016, p. 2). Some teachers have a second or even a third job to make ends meet. TEE teachers have skills desirable to industry and these side jobs actually turn into a replacement job. This is one reason teachers are leaving.

There are other teachers who struggle with the working conditions. To some teachers, the working conditions are not as favorable as other nine-to-five jobs, and that becomes a reason to leave. A few non-desirable working conditions include: disrespectful students, oversized classes, difficult parents, uncompensated work time, increase in requirements from administrators, school boards and legislators.

The Alpine Mentoring Framework appears to be working. In the last two years, ASD has not had any middle school TEE teacher leave the classroom. Specifically, none of the teachers who participated in this study have left their school or teaching. Teachers

who participated in this study report the three primary benefits of this mentoring program were: classroom management, additional help, and direction on lessons.

Well-trained teachers often use a lesson plan or script that is a step-by-step instruction guide for delivering an effective lesson to their students. If a lesson plan is not used, key components, which are important to the education of the students, may be left out and not discussed. Like a well-trained teacher who uses a lesson plan to deliver an effective lesson, a well-trained mentor should use a lesson plan, or a mentoring framework, to deliver an effective mentoring visit. Many times a mentor makes a visit but key important components are forgotten or are just not discussed because they are not written down. The use of the mentoring framework will allow even new mentors the ability to conduct a positive mentoring visit.

Items that were changed

- Throughout the study, the researcher modified mentoring items as needed including wording changes and timeline of discussion points.
- It was difficult at times to have the new teachers give 20-90 minutes each month for mentor visits. Consequently, some visits needed to be shortened while others could be extended when time permitted.
- Each monthly meeting should have been scheduled with a specific appointment time and not as a drop-in visit. Teacher and mentor are less likely to miss a set appointment. A line was added at the top of each monthly mentoring sheet to write down the date and time of the next meeting.

- A question was added to the top of the monthly mentoring sheet in order for mentor and teacher to get to know one another better and encourage relationship building between mentor and teacher.
- The first visit took place sometime between mid-July and the end of August. There was too much information to be effectively covered in that visit. The first visit cannot only be the mentor teacher mentoring the whole time. There needs to be time for questions by the new teacher. The new teacher would be better served if the first visit was broken up into two visits. After conducting the study twice, the researcher broke the first visit into two visits: one to take place late July or early August and a second to occur mid-August. Making two visits at the beginning of the school year could also help ease the nerves of the new teachers.
- “Exit Slip” questions were added to the bottom of monthly mentor sheets.
 - What did you find helpful about today’s meeting?
 - What else would you like to learn about this topic?
 - What did you not find helpful?

These questions were not only helpful for feedback to the mentor, but also allowed input and buy in by the new teacher.

Recommendations

There are a myriad of obstacles in implementing an effective mentoring program. From the mentor’s perspective, conducting the required surveys required a great amount of time, especially considering travel across the largest school district in Utah. Distance of travel takes away “time on task” for both teachers involved. New teachers also have the challenge of learning to balance the responsibilities and juggle the time demands of family, teaching (planning, grading), extra teaching responsibilities such as coaching

sports, etc. While new teachers saw the benefit in the mentor visits, mentors discovered the need to be flexible based on time demands. A possible solution to this would be having a veteran teacher at the same school or a school close by be the mentor for the new teacher. Ideally, the mentoring process would be most effective if the mentor and the new teacher were in the same building; however, the content of the mentoring visits would be consistent because each mentor would use the same framework.

The original framework has the CTE Month discussion scheduled in January. In order to give more time for scheduling CTE sponsored events, it would be better to move the CTE Month discussion to December. This would allow new teachers more time to make proper preparations.

As the researcher made the mentoring visits, it was determined that it would be more effective if there were set dates and times for the meetings. A change that should be made is to set a date and time of the upcoming mentor visit. This would allow for proper scheduling. Everyone has conflicts arise but if an appointment was set, both mentor and new teacher to easily place this on a calendar and remember it.

Throughout the course of the project the researcher noticed that it would be a positive change in the mentoring framework to add a few lines that would contain assignments or “exit slip.” The exit slip includes items the new teachers could work on and or reflect on. The exit slip idea comes from William Sterrett, (2011, p. 39).

1. What did I find helpful about today’s meeting?
2. What did you not find helpful?
3. What else would you like to learn about this topic?

The researcher changed the order by switching the second and third questions. The researcher believes this order follows a more natural thought process when you want to learn more about something that you thought was helpful. The “I” in the first question was also changed to a “you” as the questions are directed to the new teacher and not the mentoring teacher. These questions will be answered by the new teacher and will provide meaningful feedback for the mentor.

There are many challenges facing education right now some of which cannot be remedied through mentoring. However, mentors can help new teachers become better prepared for many of the challenges they will face in the classroom by using an effective mentoring framework. Mentoring our new teachers will be a key step to help with the retention of new teachers. We cannot lose the opportunity to train those who are choosing education and the few who are staying.

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APPENDIX A
CTE Mentoring Framework

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

July/August Checklist

The following item can be used to get to know one another.

- *Why did you become a teacher?*

Possible Mentor Items:

- School Culture: Mission, Vision, Values, & Goals
- School procedures, bell & lunch schedules
- Grading System (Skyward)
- Substitute system (Kelly Services)
- Building orientation
- Evacuation plans (Emergency procedures)
- Seating charts
- Policies/practices (substitutes, contract time, sick days, productivity, etc.)
- Room set-up
- Classroom management/class rules (post rules and or consequences +/-)

CTE Specific

- *Curriculum (USOE Standards)*
- *Disclosure Document (including CTE Disclaimer)*
- *Budgets, fees, materials, purchasing process, etc.*
- *Purchase needed supplies (Supplier list)*
- *Safety Tests & demonstration & Storage of Safety Tests*
- *First aid & CPR training*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

Mid August Checklist (Split August into two visits)

The following item can be used to get to know one another.

- *Share an experience of your first days of teaching?*

Possible Mentor Items:

- Solid teachers close by who can help
- LMS training (Mastery Connect)
- Flex time & Remediation process
- Emergency sub plans
- Hall pass privileges
- 7th Grade day schedule
- Back to School Night

CTE Specific

- *Sub plans (No students in shops or using machines)*
- *Introduce CTE Coordinator*
- *Collaboration 1st & 3rd Mondays*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

September Checklist

The following item can be used to get to know one another.

- *What are three things interesting about you?*

Possible Mentor Items:

- Lesson plans
- Midterm procedures
- Preparation period and how to use it
- Review Skyward issues
- Review Mastery Connect issues
- Classroom management issues
- Faculty room lunch procedures (positive talk)
- Parent communication (Skyward, email, phone, etc.)

CTE Specific

- *Curriculum (State skills test)*
- *Review budgets- school, legislative, CTE*
- *Class sizes (seating arrangements)*
- *Getting to know students, faculty & staff*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

October Checklist

The following item can be used to get to know one another.

- *Share info on family. Maybe?*

Possible Mentor Items:

- First term grades & procedures
- Parent Teacher Conferences
- Evaluations
- Data collection & Mastery Connect
- Lesson plans & curriculum (continued)

CTE Specific

- *CTSO training*
- *District CTE Professional Development Day*
- *Review Collaboration 1st & 3rd Mondays*
- *Review behavior in lab, kitchen, shop*
- *Storage of Safety Tests*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

November Checklist

The following item can be used to get to know one another.

- *Three things that you have done, that no one else has done!*

Possible Mentor Items:

- Strengthen areas of concern from term 1
- Behavior management and the Holidays
- Professional Learning Communities (PLC's)
- Lesson plans & curriculum (continued)
- Using positive interventions

CTE Specific

- *Register for UACTE Mid-Winter Conference*
- *Review Budgets, purchasing process, etc.*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

December Checklist

The following item can be used to get to know one another.

- *What do you want for Christmas, or Christmas break plans?*

Possible Mentor Items:

- Christmas break dates and student expectations
- Post break start up lesson plans & supplies
- Budgeting December paycheck
- Behavior management

CTE Specific

- *State Skills Test*
- *Purchase needed supplies (for next semester)*
- *New semester copies: Disclosure Documents, safety sheets, etc.*
- *Preparation for CTE Month (February)*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

January Checklist

The following item can be used to get to know one another.

- *Who was your favorite teacher? And why?*

Possible Mentor Items:

- Re-visit School Culture: Mission, Vision, Values, & Goals
- Mid-year reflections, how is it going?
- Health issues (flu, colds, etc.) clean desks
- Re-establish behavior management, rules, procedures and routines
- End of 1st semester procedures
- Start of 2nd semester procedures
- Disclosure documents

CTE Specific

- *Review CTE Month plans*
- *Box up and keep safety tests from 1st semester*
- Classroom binder for counseling to show classes
- Registration for next year, 6th & 9th graders
- Transitioning students for next year
- Final preparations for CTE Month in February
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

February Checklist

The following item can be used to get to know one another.

- *Which teachers have you been able to get to know?*

Possible Mentor Items:

- Parent Teacher Conferences
- Valentines Day advice (for the students)
- Upcoming midterm procedures

CTE Specific

- *Student Registration classes for next year*
- *CTE Month (this month)*
- *Begin to review budgets*
- *State CTSO Competition preparations*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

March Checklist

The following item can be used to get to know one another.

- *What was your favorite vacation? And why?*

Possible Mentor Items:

- You can do this, not many vacation days
- Classroom procedures (Revisit/re-teach, model and practice)
- End of third term procedures
- Self check on positive vs. negative ratio, review positive interventions

CTE Specific

- *Finalize all out of state purchases with District funds*
- *End of year purchase list/Review budgets*
- *State CTSO Competitions (Buses & Subs)*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____
 Date & Time of next meeting: _____

April Checklist

The following item can be used to get to know one another.

- *What are your Spring Break plans?*

Possible Mentor Items:

- Curriculum for the end of the year
- Summer collaboration opportunities
- Students being gone from your classes: concerts, sports, Sage testing, etc.
- Graduation/Completion activities preparation (certificates)

CTE Specific

- *Finalize all purchases with school funds*
- *Preparation State Skills Testing*
- *Review budgets with Finance Sec.*
- *National CTSO competitions preparation*
- *Summer Conference registration*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?

CTE Mentoring Framework

Mentor Teacher: _____ New Teacher: _____
 School: _____ Date of meeting: _____

May Checklist

The following item can be used to get to know one another.

- *What are your summer plans?*

Possible Mentor Items:

- End of year reflection
- Behavior management for the end of year
- End of year activities
- End of year procedures/checkout
- Students being gone from your classes: concerts, sports, testing, etc.

CTE Specific

- *State Skills Testing/Documentation forms/Certificates*
- *Inventory textbooks, computers, machines, etc.*
- *End of year cleaning of Shop, Kitchen, Labs*
- *Maintenance of machines*
- *Check Summer Conference registration*
- *Surplus old or unused items*
- *Class roster sheet from District*
- *Questions???*

Exit Slip Items:

- What did you find helpful about today's meeting?
- What else would you like to learn about this topic?
- What did you not find helpful?