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Teacher Perceptions of Math Professional Development in a Small Vocational School

Nisha Woody
Walden University

Walden University

College of Education

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Nisha Woody

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Walden University
2019

Abstract

Teacher Perceptions of Math Professional Development in a Small Vocational School

by

Nisha Woody

MEd, Alabama State University, 1998

BS, Alabama State University, 1994

Project Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

February 2019

Abstract

The vocational math teachers at a vocational secondary school lack the adequate skills needed to be effective in math classrooms. The vocational teachers who teach math at the local vocational school have been identified as noncertified teachers based on their certification with the state department of education. The purpose of this project study was to determine the best professional development sessions needed to improve the instructional practice of untrained math teachers at the school. Their work is critical to the academic and career development of students. The social development theory of Vygotsky, which states that social interaction has an effect on individuals' growth and development, was the conceptual framework for this study. The research question focused on teachers' perception of the best approach to improve instructional strategies of vocational teachers in math. A qualitative case-study design was used to collect data from 8 teachers using interviews at the local vocational school. Data were analyzed and coded based on common themes. Member checking and triangulation of the data were used to ensure accuracy and credibility. The findings of this study showed that teachers at the study site need professional development, specifically a district policy ensuring that vocational math teachers receive professional development training, common planning time, participation in professional learning communities, and support in understanding the math objectives they are expected to teach to ensure their continuous improvement. This project may influence social change by spurring administrators to provide additional training to vocational educators, which may improve the quality of teachers' level of instruction and subsequent student outcomes.

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Dedication

My doctoral journey is dedicated to my mother, Martha Reese, and father, Lewis Reese. My mother and father have been an inspiration to me and my reason for working toward this monumental goal. I would like to say thanks to both for their parenting and their significance in my life. My work is also dedicated to my loving and supportive husband, Michael T. Woody; my two loving children, Michael T. Woody, Jr. and Reese LaCheryl Woody; and my brother, Trammell Reese, who was just a phone call away to encourage me through some of my tough times. My family has always been instrumental with its love and understanding during my quest for a doctorate degree. I would like to also thank my family for supporting and caring for me through the tough times and believing in me. The support of my family goes unmatched.

This dedication addresses the background of the morals and values I received as a child and a representation of what both of my parents mean to me. I am truly blessed to have them nurture, care, and guide me throughout my life and stand beside me throughout this doctoral journey.

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Section 1: The Problem

Introduction

Vocational schools in the United States are designed to prepare students to enter the workforce (Neid, Boccanfuso, & Bynas, 2015). Training is provided to students in various career fields. These schools normally focus on short-range programs that allow students to graduate trained for a career and ready to quickly enter the workforce (Neid et al., 2015). Vocational fields include areas such as carpentry, automotive, electricity, law enforcement, health care, and technology (Neid et al., 2015).

Although vocational schools focus on helping students acquire professional skills needed to succeed in the workforce, they are also charged with ensuring that students acquire literacy skills to function in society (Pears, Kim, Fisher, & Yoerger, 2016). Teachers must support students' learning needs in core content subjects such as reading, English language arts (ELA), math, and science (Roosevelt, Diebel, & Zielinski, 2018). Vocational teachers teach in the technical fields and provide instruction to students who are interested in various career fields (Goh, 2015). Although vocational teachers are trained to teach skills related to their respective career fields, they are also challenged to teach academic content for which they may not have skills or training, such as math, science, ELA, or reading (Goh, 2015). The history of low math scores on state standardized tests at Gump Vocational Secondary School (pseudonym) suggests problems with math instruction.

To meet students' individual learning needs, teachers must be equipped with instructional strategies that support acquisition of basic math skills as they are applied to

real-world situations and career readiness (Lee, 2016). Instructional quality is a major contributor to successful schooling (Boston & Condela, 2018). According to the interviews I conducted, at the study site, instructional quality for math was not sufficient to support adequate learning in math, based on student test scores. Teacher qualification directly affects student learning and positive outcomes (Johnston, 2016), yet vocational math teachers I interviewed lacked training focused on teaching math. For optimal outcomes, vocational teachers must possess the experience and the skills needed to effectively teach content for areas they are assigned classes, according to Miner-Romanoff, Sweetland, Yang, & Fennema, 2019); however, according to the interviews I conducted, training for the vocational math teachers at the school focused on the careers areas in which they specialize, but not on math instruction. Vocational teachers have a unique technical skill set that key to these teachers' effectiveness in their content areas (Johnston, 2016). In addition, vocational teachers provide real-world application and experience to support student learning (Johnston, 2016).For student performance in math to improve, vocational math teachers need to improve their skill in teaching math concepts.

The Local Problem

The problem at a small secondary vocational school in the southeastern section of the United States is that vocationally trained teachers are not adequately prepared to teach math. The vocational teachers at Gump Vocational School, according to the interviews I conducted, have vocational skills that are not aligned with the skills needed to teach math. These teachers use a hands-on approach to teaching work-related skills in the

students' area of career interest. During the interviews, the teachers indicated their strengths are in the areas of skill-related content as opposed to academic instructional practices. According to the state department of education, vocational teachers apply for Career Tech Certificates, which are noncertified education certificates. Vocational teachers do not receive a certification in a content area such as math.

Teachers who have adequate skills needed to become successful in the classroom are less likely to leave the profession. According to Bush (2014), qualified teachers who understand the concepts and strategies in math have produced productive citizens ready to enter the workforce. Some vocational teachers have not been adequately trained to provide effective instruction in math, however (van der Lans, van de Grift, & Van Veen, 2018).

Several factors affect vocational teachers' math skills, such as lack of experience, lack of training, and their attitude toward math (Bush, 2014). Of these factors, training is a critical part of quality instruction and teacher success (Bush, 2014). Teacher training may be viewed as modeling instruction to improve the academic performance of students (Minckler, 2014). As Minckler (2014) observed, teacher training must be effective to produce the expected outcome from students. Vocational teachers are trained to teach specific skills for a career field and entry-level education, which is different from the traditional training that certified teachers receive in their methods courses (van der Lans, van de Grift, & Van Veen, 2018). Thus, the specific nature of the educational training they receive can result in vocational teachers being less prepared than certified teachers to teach math subjects.

The local school data from the American College Test (ACT) Work Keys revealed that students in Grade 12 did not reach an adequate level of proficiency in math. The data from the ACT WorkKeys in 2015 reflect an average score of 323 in Applied Mathematics (Alabama State Department of Education [ALSDE], 2016). This score represents 21.17% proficiency on the ACT WorkKeys for students who took the test. In 2016, the state department of education reported a score of 337 on ACT WorkKeys, representing a 20.35% proficiency rating on this standardized test, and a decrease in achievement compared to the previous year. The school's profile data indicated that factors accounting for these low math scores included the staff being comprised of vocational teachers who did not hold a traditional teaching certificate and first-year teachers, coupled with poor lesson planning. The results retrieved from the 2015–2016 academic year revealed that 47.8% of the students who took the ACT WorkKeys did not make passing scores in math.

Math is an accountability area used to determine a school's status report of passing, failing, or priority in the southern state in which Gump Vocational School is located (ALSDE, 2013). These data are used to identify achievement gaps and determine actions needed to close them. Closing the achievement gap is a special challenge for math teachers who lack adequate training to teach students who need to develop specific skills to achieve higher-level proficiency in math.

Teachers who are untrained are a target group for professional training (Lewin, 2012). Scheduling training sessions to model effective instructional techniques may help to improve untrained vocational teachers' pedagogical practices (Lewin, 2012).

Currently, no policy exists to require it, yet such training could help address the local problem of math teachers' lack of adequate training. Effective instruction may help improve untrained vocational teachers' practices, enabling them to be instrumental in addressing the local problem of teachers lacking adequate training to provide effective math instruction. Untrained teachers, as a homogeneous group, have a tendency to perform at a low level (Freeman, 2013). In addition, many untrained teachers view the job as a complex situation and find it difficult to improve student test scores (Turner, Christensen, Kackar-Cam, Fulmer, & Trucano, 2018). Johnson (2014) indicated that teacher training is no longer perceived as knowledge being received, but as demonstrative work to accomplish professional growth. In this project study, I explored approaches for providing adequate training for vocational teachers charged with teaching math at the vocational secondary school under study.

Officials at the school first expressed concern regarding the underperformance of students taught by untrained vocational teachers at Gump Vocational School during a school leadership meeting. The leadership team consists of the school's principal, assistant principal, school counselor, and the department chairs. A review of the school's data profile history for the ACT WorkKeys showed that math scores were substantially lower when compared to scores for reading and locating information. Recognizing that this test score disparity was a problem, the school leadership identified the root of the issue as vocational teachers in math who had technical training in their professional skills area but lacked the skill to be effective teaching math when evaluated by the school's administrators (see Cotton, 2015). As a result, the leadership team devised a plan of

action that would provide additional support for vocational teachers who struggle with providing math instruction. The Plan of Action allowed struggling teachers to observe effective instruction, take notes, and implement effective strategies in their classroom. This plan allowed opportunities for corrective action and feedback to improve instructional practice (see Grossman, Loeb, Cohan, & Wycoff, 2013).

At the time of the study, Gump Vocational School was in its sixth year of existence. Educators at the school implemented a team concept to meet the academic needs of their students (Alabama State Department of Education [ASDE], 2013). The goal of the school's team concept was for faculty to work collaboratively so that students were well prepared for employment. This approach was designed to provide prospective employers with potential employees who have been well trained to meet their organizations' needs. Gump Vocational School also prepares students academically, so students can gain entrance in college. It is essential that vocational teachers and staff work together to ensure that the enrolled students meet their career interest goals and academic requirements by the end of their enrollment (Turner, Christensen, Kackar-Cam, Fulmer, & Trucano, 2018).

Gump Vocational School is located in the central part of a southern state. The vocational school has a unique setting which is different from traditional schools in the United States. The characteristics of a secondary vocational school include a setting where the academics include technical training aimed at preparing students to succeed in their chosen career area. Students are exposed to real-world situations by skilled vocational teachers who teach a trade in the classroom (Anderson, Bull, & Priddy, 2017).

Real-world situations are presented in classrooms, so students become attuned to their specific learning needs (Belland, 2013). Learning opportunities provided in the vocational setting help equip students with real-world skills to perform in a working environment (Belland, 2013). Teachers may have a better understanding of real-world situations that relate to students becoming productive citizens and making social change. Teacher's cognitive development and lived experiences with real-world application contribute to student success (Kennedy, 2014).

The Gump Vocational School students' specified training allows them the opportunity to earn a professional certification, while also meeting general education requirements for graduation. Students can also earn 2 years of college credits by being enrolled in the vocational school and a college through dual enrollment. In vocational schools, there are opportunities for students to earn or pursue further study in 4-year colleges or postsecondary programs (Broadbent, Panadero, & Boud, 2018).

Course offerings at the local secondary vocational school usually include advertising, technology, construction, mechanical systems, medical science, and welding. This curriculum is designed so students can earn two credits at the end of each school term and have the credentials to enter college with approved credits. The opportunities for college credits are earned in the medical science and technology fields at 2-year institutions. The students who are accepted in the local secondary vocational school are admitted based on meeting the admission policy.

To be admitted to this vocational school, students must complete an application, meet attendance requirements, select a career field of interest, meet course requirements,

complete an interview, and show adequate academic progress. This vocational school is accredited by AdvancED. AdvancED is an organization that conducts reviews of educational systems to make sure that all guidelines and learning practices are adequate (AdvancED, 2018). The goal of AdvancED is to ensure that school systems are in good standing and continue to work towards improvement. The principal, who is supported by an administrator, guidance counselor, career coach, and department heads, governs the organizational structure of this vocational school. The leadership committee's responsibilities include determining eligibility of students, processing applications, following admission procedures, and adhering to acceptance procedures for new students.

The faculty consists of two math teachers, nine career and technical teachers, two special education teachers, one aide, and two career coaches. The teachers are responsible for providing instruction so that students become well prepared to function in society and the workforce. Only one math teacher is highly qualified based on federal standards according to the school's report card. This vocational school has experienced a deficit in math based on the results from ACT WorkKeys, the skills assessment test that is used to measure the academic status of the school each year by the state department of education.

Vocational teachers play a role in assisting students to identify their career interests and make decisions about their education pathways that support their skill set. Closing the achievement gap is an important part of the process in preparing students for career choices and postsecondary education. The achievement gap refers to differences in student achievement among groups of students based on their ethnicity, gender, race, and socioeconomic status (Webb & Thomas, 2016). Closing the achievement gap may

improve the employability status of students as they prepare for jobs and careers. Prospective employers review student test scores from the ACT WorkKeys and rank them according to the results. Student math scores on the ACT Work Keys assessment have raised a concern about teacher effectiveness in preparing students with the skills needed for the workforce and meeting academic requirements. The growth and development of the faculty and staff may depend on the professional training they receive. Closing the achievement gap necessitates addressing the teachers' instructional practices. It is noteworthy that vocationally trained teachers at the school under study are provided with additional support from district trainings, observations, and mentoring for professional growth.

Rationale

This study took place at a secondary vocational school in a district that is experiencing issues that have raised concern at the local and state level. This school district has been targeted with a state takeover because the number of schools on the failing list has increased. Gump Vocational School is not one of the targeted schools (ASDE, 2016); however, the low performance in math test scores on the ACT WorkKeys was cause for concern among school leaders and teachers. State officials examined the low performance based on the evaluation of school leadership, instructional practices, and academic performance. The information gathered led local school officials to examine day-to-day operations of Gump Vocational School. Whether a school is succeeding of failing is determined by student achievement and learning gains in the areas of reading and math. According to ALSDE (2013), learning gains are measured by

the level of proficiency students score on the ACT Aspire from one year to the next. Student achievement encompasses the overall academic performance of each school as measured by ACT Aspire for each academic year (ALSDE, 2013).

The ACT Aspire relates to ACT WorkKeys by connecting student progress from elementary grades through high school (ACT Aspire, 2016). ACT Aspire tracks learning progress in Grades 3 through 8 and 10 to measure academic growth and student success (ACT Aspire, 2016). ACT Aspire allows teachers, parents, and instructional leaders the opportunity to track the academic performance of students during their academic career in k-12 education. Test scores from both ACT Aspire and ACT WorkKeys can be used to drive instruction so teachers can address specific standards and areas of deficiency in low-performing students. Students at Gump Vocational School are at risk for failing to show academic growth because there is only one teacher specifically trained in math education employed at Gump Vocational School.

According to ALSDE (2016), the test results on ACT WorkKeys are nonproficient. The ACT WorkKeys, 47.8% of the students were nonproficient. The ACT WorkKeys is administered at the vocational school to assess students' proficiency as it relates to their college or career interests. Future employers can review students' test scores and rank students according to ability to see if they meet the minimum requirements for hire or college admission (ACT WorkKeys, 2016). According to ACT WorkKeys data, 52% of students who are proficient with the annual target goal are chosen for hire at the end of their performance cycle.

The purpose of this study was to examine the perceptions of vocational teachers' regarding needed teacher support and improve math instructional practice at the targeted school. The study featured a qualitative case-study design, which was used to identify what support teachers needed to improve their math instruction and ultimately students' math scores on the ACT WorkKeys test. I collected data during one-on-one interview sessions.

Definition of Terms

Achievement gap: "The observed disparity in a number of educational measures in academic performance between different groups of students, especially groups deferred by race, gender, and socioeconomic status" (Clark, 2014).

College and career readiness: The level of preparation needed to enter college and earn credits without remediation. High school graduates with such readiness have the knowledge base needed to qualify for college or vocational training or a chosen career (Walker, 2016).

Instructional practice: A teaching strategy used by teachers to meet the learning needs of students to develop critical thinking skills to improve academic performance (Hill, 2016).

Professional development: Training opportunities provided to improve teachers' instructional practice so their lessons are more effective and enable students to learn at a higher level (Lee, Kinzie, & Whittaker, 2013).

Vocational school: A learning institution that provides coursework designed to prepare students for employment or entry-level college (National Center Education Statistics, 2016).

Vocational teacher: A person who teaches in the technical field of education (Goh, 2016).

Significance of the Study

Students in Grade 12 at Gump Vocational School did not perform well on standardized tests in math. Lack of trained teachers may lead to difficulties with students graduating from high school (Tamim & Grant, 2013). The school's Continuous Improvement Plan (CIP) identified 11 vocational teachers who are not highly qualified to teach math. It is not clear if these 11 vocational teachers' lack of highly qualified status contributes to low performance. Further research is needed to gain a better understanding of the problem associated with untrained vocational teachers who may lack the skills to be effective mathematics teachers. Results on the ACT WorkKeys (2016) for the 2015–16 school year indicate low math proficiency among Gump Vocational School students. Students demonstrated above average reading test scores on ACT WorkKeys (2016). The school's leadership team determined that it should emphasize improving student outcomes in math.

Hayden (2017) indicated teachers' objective should be to develop skills to meet the demands of human development in vocational education. The district's leaders monitor skills based on the vocational educational program and the benefits that students receive from vocational teachers. The teachers' education is important to the

organization, and vocational teachers' expertise accounts for a large part of students' academic success (Hayden, 2017). In addition, the success of vocational teachers arises from careful planning and organization with the direction of the school's principal.

Participants in this study indicated that they need professional development training specifically related to math instruction, including development opportunities that allow them to share successful practices with each other. Current policy requires these teachers to receive professional development training in their areas of vocational expertise, but not in math. Providing vocational teachers opportunities for math professional development will be beneficial in improving students' skills in this area. The base skills in mathematics are essential for being productive in society (Tamim & Grant, 2013). According to Canning (2011), when students are skilled in reading and math, they have an effect in their community and workplace. In addition, students are being prepared for college and career.

Research Question

Gump Vocational School is the only vocational secondary school in the local school district. The school is designed with a curriculum that is standards-based and focuses on career development for students who are interested in either applying for entry-level college or joining the workforce. The problem identified at Gump Vocational School was that technically trained vocational teachers lacked adequate skills to teach math. The school's mathematics test score data show low academic performance among the Grade 12 students as measured by ACT WorkKeys. The following research question (RQ) was used to guide this study:

RQ: What are vocational math teachers' perceptions about their knowledge and use of instructional strategies for teaching math?

To address this overarching question, I developed the following two research subquestions (SQs).

SQ1: What are vocational math teachers' perceptions of the current training they receive to teach math to students enrolled in Gump Vocational School?

SQ2: What instructional training do vocational math teachers believe should be offered to enhance the instructional skills needed to improve academic performance?

Review of the Literature

This study focused on collecting information regarding the best approach to improve instructional strategies of vocational teachers teaching math. The problem at Gump Vocational School is vocationally trained teachers who are credentialed in a technical area are not adequately prepared to teach core academic courses. The vocational teachers at this school hold a career technical education certificate. According to State Department of Education (2013), a career technical education certificate credentials individual teaching in a technical program. Google Scholar and Walden University Library provided platforms for examining literature related to this study. Search topics included the following: *vocational schools, conceptual framework, college and career ready standards, ACT WorkKeys, teacher turnover, professional development,* and *professional learning community.*

Conceptual Framework

The goal for this local secondary vocational school is to improve the instructional strategies of vocational math teachers, so there is an increase in student achievement. The conceptual framework guiding this study is derived from a social development approach. According to Vygotsky (1978), social development theory involves personal interaction to develop individuals' cognitive skills. Vygotsky (1978) suggested that individuals learn through collaborative dialogue, which allows people to learn from one another. Vygotsky's theory of social development focused on building intellect in preparation for learning. For example, teachers engaged in collaboration to discuss instructional practices to teach various standards in their content area often rely on the activities aligned with the standard to produce an outcome. This method of collaboration allows teachers to discuss, plan, and implement techniques with each other to improve learning opportunities. Vygotsky (1978) also noted social interaction provides a foundation for building a strong knowledge-base to construct new information.

The conceptual framework of social development has an important role in the development of individuals. Vygotsky's (1978) social learning theory focused on individuals' interactions with their environment. He believed that individuals learn as they engage in events or activities around them. The more individuals engage in what they do, the greater is their mental capacity to develop and function effectively (Vygotsky, 1978). This conceptual approach focused on supporting the weaknesses of individuals through social learning opportunities in which more skilled members of the group help others gain new knowledge. Teachers' experiences interacting with other

teachers can assist them in improving their ability to teach. Social learning theory supports this idea. Vygotsky (1978) said working with the support of more skilled individuals provides scaffolding to help learners (in this case teachers trying to improve their math teaching skills) to successfully engage in new activities.

Vocational Schools

Secondary vocational schooling has provided an alternative way for students to become educated in society. According to the National Bureau of Statistics (2014), vocational schools received funding to invest in students' academic and career interests. It has been reported that 100 dollars per student is needed to support vocational schools. The enrollment for the vocational setting has increased during the 21st century (National Bureau of Statistics, 2014).

Secondary vocational schools are designed to prepare students with skills needed to directly enter the workforce. Although secondary vocational schools are structured to produce graduates, they are equally challenged with the task of producing graduates ready for employment (Dougherty, 2015). Policymakers have stressed the important role vocational schools to ensuring there are skilled workers who can contribute to improving the economy (Dougherty, 2015). Policymakers may view increasing the number of vocational schools in the country as a way to develop potential employees. The commitment to support secondary vocational schools may be important to the overall success of student achievement (Pop, 2015).

Ling (2015) mentioned that policymakers understand that student success happens when vocational schools are aware of the requirements needed to enter the workforce.

Policymakers have emphasized teacher effectiveness, professional training, and resources needed to meet the individual learning needs of students. It is believed that these elements will guide student achievement and develop skills needed to become productive citizens. In addition, secondary vocational schools may use specific standards to measure the academic growth rate of students. Teachers play an important role in helping students in the process of achieving their academic goals (Ling, 2015).

Historically, vocational schools have played a major role in the development of high school students. According to Gejeka (2013), a number of countries graduate one-third of high school students with vocational skills and prepared for the workforce. Countries like Austria, Germany, and Spain have increased the number of vocational schools available to secondary students (Gejeka, 2013). The United States has reported that more than 80% of high school students that graduate earn at least one vocational education credit (NCES, 2013). Vocational education has a direct effect on student learning in the United States.

According to Plackle et al. (2018), vocational education affects adult skills and industry outcomes. Plackle et al. noted that data from across the country indicated training, earning, and employment were major components of vocational education that are not typical compared to more traditional academic education. The vocational approach is considered because it is limited to career interest. Vocational education exposes students to post-secondary learning. Vocational education has positive effects in the U.S. workforce, which has led to policymaker support of this type of schooling to increase employment and enrollment into college (Plackle et al., 2018).

The curriculum of vocational schools is designed to focus on building skills for employment. To gain the support needed to maintain a high level of success in vocational schools, vocational education schools need to maintain an ongoing partnership with policymakers (Ling, 2015). Secondary vocational school curriculum should provide opportunities for students to participate in an internship to gain entry level experience for future job placement, and policy that supports such opportunities is vital (Flynn, 2016). Policymakers are also instrumental in secondary vocational schools having the proper equipment to support nurturing skills needed for students to be successful in their chosen career field. The secondary vocational school needs to have classroom with labs, workshops, offices, lockers, and resource rooms (Johnson, 2016). Policy support in these areas ensures students receive proper training in key skills in an environment that promotes efficiency and productivity.

In addition to having policy that provides for well-equipped school facilities and supports students in gaining practical school both in school and in the community, to be successful need quality instruction. For example, teachers who are adequately credentialed promote learning and prepare students for standardized testing. According to Johnson (2016), vocational secondary schools that have a curriculum aligned with standardized tests improve the employability level of students as they develop skills for industry. In addition, local school district officials and policymakers should agree that teacher quality, equipment, and adequate faculties are essential to having a quality program at secondary vocational schools (Johnson, 2016).

College and Career Ready Standards ACT Alignment

Students need to be prepared to enter a career or college on graduation from high school. Having information about college and career readiness standards is critical for students who are considering college attendance (Cervetti & Hiebert, 2015). The information allows students and teachers to be better prepared, so they can make a sound decision about college entry based on a clear understanding of the dynamics of postsecondary education. Concern exists regarding college and career readiness as it relates to the economic welfare of students (Buskist et al., 2016). Helping students understand the possibilities and requirements for postsecondary education helps ensure they will have opportunities to learn beyond high school.

The college and career readiness standards measure how ready students are to enter the labor force or enter college after high school graduation (Buskist et al., 2016). These standards allow students the opportunity to learn new skills in case a student decides to change careers. The future of students may be directly affected by college and career readiness standards designed to develop the country's economy. Students, who are capable and possess the ability to learn new skills, are at an advantage (Lee, 2016). College and career-ready standards are intended to help prepare students to become lifelong learners by developing a foundation for their career interest. College and career readiness standards aligned with English and math skills are important because basic literacy skills are vital for functioning in society (Dalton, 2017). Science, social science, the arts, and technical subjects are also areas of importance to aid students in becoming well-rounded learners.

Students who achieve high academic standards prepare themselves for college and career. College and career readiness standards, which are aligned to the content areas, provide the students with the best possible chance to enter college (Dalton, 2017). Students will need to maintain a high grade-point average to gain college admittance. Students who maintain a higher grade-point average increase their chance to enroll in college and possibly receive scholarships. Students' grade-point-average readily identifies the academic progress that they have made during their academic careers. Academic success at the secondary level serves to make students career and college ready as they pursue postsecondary education (Kamin, 2016).

Students who are college and career ready have the skills needed to be successful in any postsecondary school (Phillips, 2015). Student who experience success have the ability to finish their coursework and begin the next course in their chosen field of study. Student readiness is determined by knowing students' learning skills, career interest, and goals (Rotham, 2014). It is important to know about student's skills and interest along with characteristics such as study skills, persistence, willingness to seek assistance, and reading and math skills (Rothman, 2014).

Although college and career readiness standards focus on English and math for certain fields of interest, students who study in other areas receive a foundation of knowledge and skills, so they can become specialists in their area of concentration. Each field of study requires a number of strategies to build the intellectual capacity of the students (James, 2016). Emphasis is placed on critical thinking to solve problems, so students can make rational decisions in future situations. Another component of college

and career readiness is students' ability to transition into adulthood from high school or college. This transition can be difficult for some individuals, which is why having the ability to make decisions is critical. According to Weis, Dean, and Osborne (2016), teaching students the decision-making process will better prepare them to reach their goals because they will be able to approach problems in different ways. Students who lack the ability to apply these skills may also experience a deficit in reading and math skills when they are measured by the ACT assessment tool.

The ACT assessment tool has been structured to align with state college and career readiness standards. According to Clough and Montgomery (2015), President Johnson agreed to sign the original Elementary and Secondary Education Act (ESEA), which was initiated to ensure all students had an opportunity to receive the best education possible. ESEA was to be renewed every 5 years to ensure education was the focus of improving the country (Clough & Montgomery, 2015). The last reauthorization of the education act was the Every Student Succeeds Act (ESSA) under the Obama administration. The federal government allowed ESSA to address standards for high-quality education in each state.

Teachers are valuable to the learning process when they are equipped with the necessary skills to improve academic growth (Strauser, 2015). Teachers are challenged with the task of providing explicit instruction to increase student achievement. The ACT annual assessment is administered to measure academic growth in schools (Clough & Montgomery, 2015). Some question if the ACT is aligned with college and career readiness standards (Clough & Montgomery, 2015). According to Strauser (2015), ACT

assessment produces data and contributes to research used to develop college and career readiness standards. The ACT assessment was not, however, developed to monitor the progress and growth of these standards (Cruce, 2015). ACT data are used to provide information for postsecondary education and career interest (Cruce, 2015). ACT data identify what knowledge and skills students need to be ready for entry-level education and careers. This assessment tool measures student's academic performance in the content areas of English, mathematics, reading, and science. Student who reach a high level of proficiency are targeted as ready for postsecondary education and the workforce. The issue remains, however, that ACT assessment standards are not aligned with content standards as set forth by each state.

ACT WorkKeys

The purpose of the data collected from ACT WorkKeys is that it is used to examine trends in changes from year to year. ACT WorkKeys is an assessment tool used to help prospective employers hire, train, and develop potential employees for the workforce (LeFebvre, 2015). ACT WorkKeys assesses cognitive skills in reading, math, and locating information. According to LeFebvre (2015), reading, math, and locating information skills have been identified as three components essential for employment. ACT WorkKeys data revealed test scores that were inconsistent from 2010-2014. The scores indicated that students are neither proficient nor career ready. The test scores pose a problem for employers because they cannot readily rely on highly proficient students for the next year.

ACT WorkKeys is administered at the vocational school to assess students' ability and determine if they have made adequate progress in their academic performance. The student outcomes are compared to the previous school year's test results to analyze academic growth and interpret the proficiency rate. Students' test scores may be used to help them decide on their career field of interest. A vocational school offers students an opportunity to express interest in a specific career field along with academics (Polat, 2016). When students do not gain the necessary knowledge for their career path, they are considered unqualified for employment and do not earn their certificate for the workforce.

Students take part in an academic assessment that is used in helping to determine their career path. Students take a benchmark assessment that measures their academic skills. The students are expected to score in the 85th percentile to show a high level of proficiency. According to ALSDE (2013), the local secondary vocational school under study measured below the level of mastery, scoring in the 60th percentile on the ACT WorkKeys (ALSDE, 2013). The results clearly identified an achievement gap for this vocational school.

Teacher Turnover

Teacher certification is required to teach in the content areas of math, science, English, and reading. The process for obtaining a valid teachers' certification in most states includes obtaining a college degree in the certification certified areas and completion of a teaching internship (Yeh & Santagata, 2015). Once this process has been completed, the certified teacher may complete an application for employment to apply

those skills learned during their college coursework. The trained teacher has studied in-depth materials and concepts about their area of specialization, so the certified teacher is competent to provide effective instruction to student learning in the teachers' respective content areas of in math, science, English, and reading. Teachers trained to teach technical skills at vocational schools do not complete this same training process, which may be a factor in their effectiveness, which in turn may contribute to turnover.

The transition of vocational teachers from one school term to the next can have an effect on academics. It is essential that teachers understand their practice and meet the requirements of the school to maintain stability in the classroom. Teachers who do not meet the expectations of student achievement, student motivation, and quality instruction have a direct impact on student performance (Arens & Morin, 2016). These ineffective teachers often leave the school, creating a high teacher turnover rate.

According to Sass, Semykina, and Harris (2014), a policy that ties teacher longevity to student test scores may create an unintended consequence. On one hand, these departures raise concern that policymakers are indifferent to the effects of teacher turnover and that achievement will be affected. On the other hand, when steps are taken to address the problem of teacher turnover, the quality of classroom instruction may be sacrificed by retaining ineffective teachers, which also affects student achievement. Teachers' inability to be effective in the classroom creates a challenge in students' ability to become prepared for life (Taylor & Tyler, 2014). Therefore, teacher turnover can contribute to academic failure and poor performance among students.

The unique workplace situations vocational teachers face provide additional barriers to retention and indeed contribute to turnover. Chingos and West (2012) noted that teacher salary is a contributor to teacher turnover. Pay may not seem commensurate with the expectation that teachers facilitate developing and improving the intellectual skills of students. Teachers are also responsible for identifying students' learning deficits, so they can foster a path of learning that produces positive outcomes, yet they may not have skills to do so, which in turn may discourage them from remaining in their jobs (Chingos & West, 2012). As barriers such as these are removed, teacher effectiveness improves.

Gump Vocational School has experienced teacher turnover among vocationally trained math teachers. Teacher turnover had an effect on student achievement in math at the local secondary vocational school. Vocational schools that have a high turnover and ineffective teacher experience weakened the school's programs. Students take very little interest in programs when teacher turnover is frequent (Guarino, 2015). There is also a notable decline in collaboration among the teachers. Ronfeldt, Loeb, and Wycoff (2013), view teacher turnover as a harmful situation that not only affects the teachers who leave, but also those who remain at the school, as they may become less productive.

Identifying the potential effects of teacher turnover and preventing them can be challenging to instructional leaders. The quality of instruction can be compromised when teachers must be moved to a different grade level or vacancies must be filled with noncertified personnel (Ost, 2014). To preserve quality instruction, administrators must make the decision to hire teachers in a way that optimizes the skills of the staff. Doing so

may help reduce turnover among teachers and afford teachers the opportunity contribute more positively to student learning.

The practice of ensuring teachers are effective can affect the lives of students as they transition from high school to postsecondary education or employment. The quality of personnel and quality of instruction can benefit students by helping ensure they are on track to have a successful career path. According to Rothstein (2015), teacher quality is essential to the academic success of a school district. Teachers are expected to provide quality instruction to improve learning. Lack of planning and poor preparation contributes to ineffective teacher practices that directly affect the outcome of academic performance (Rothstein, 2015). Teachers' attitudes, beliefs, and character are an important part of developing students' success (Thomsen, 2014). In theory, it would be ideal to dismiss ineffective teachers and replace them with teachers who are more effective; in practice, this approach may not be possible or even practical.

School districts that do not have an effective evaluation plan may contribute to ineffective teachers. Policymakers should have an evaluation instrument to collect information, so teachers are provided feedback from their observations. Observations are conducted to provide instructional support to ineffective lessons (Thomsen, 2014). When teachers are ineffective, low performance of the teacher and students must be addressed to improve teacher quality. Administrative staffs that fail to perform teacher observations and provide meaningful feedback contribute to academic failure and teacher turnover (Goldhaber, 2015).

Teacher turnover negatively affects test scores. Low-performing teachers tend to terminate their employment before the academic school term has ended (Dees & Wyckoff, 2015). Many of the low-performing teachers find it difficult to maintain structure, organization, and a climate that is conducive to learning. According to Dee and Wyckoff (2015), teachers reach a point at which they cannot withstand the pressures of the high expectations and the demand it takes to be effective in the classroom.

Ineffective teachers cannot perform well with non-White students. Improving teacher quality in schools with poor, low-performing, and largely non-White students has become an imperative of education policy (Chetty, et al., 2014). According to Chetty et al., (2014), the long-range goal of teachers should be to improve student outcomes, particularly in terms of life-preparedness skills. When teachers are ineffective, it is difficult for them to meet this demand. The effects of lacking teacher effectiveness on student performance spill over into the school district's performance (Chetty et al., 2014).

Ineffective teachers influence student outcomes (Ronfeldt et al., 2013). Teacher turnover is frequently caused by low-performing teachers who fail to meet the expectations of teacher quality in the classroom. Vocational teachers have difficulty improving academic performance in a short period of time, which leads them to leave their positions (Loeb, Miller, & Wyckoff, 2015). Research has indicated that more than 90% of teacher turnover is due to low-performing teachers. These teachers These teachers often work in high-poverty schools for which performance gaps are exacerbated by ineffective teaching (Adnot & Wyckoff, 2015). Requiring teachers participate in

professional development to improve their effectiveness and subsequently reduce teacher turnover could help improve student performance.

Professional Development

Professional development has been an integral part of teacher training to increase student achievement in schools (Desimone, Smith, & Phillips, 2013). According to Desimone et al. (2013), professional development focuses on active learning, content, coherence, sustained duration, and collective participation. Incorporating these five features into professional development training facilitates goal-centered activities that are ongoing and build interactive learning and also afford teachers the chance to improve their instructional skills (Kennedy, 2014).

Teachers who attend professional development sessions have a variety of experiences and knowledge. These variations affect student outcomes that result from professional development opportunities (Youngs, 2013). Teachers attending professional development training may have a mixture of students who are English language learners, have behavioral issues, and receive special education services or may work exclusively with a general education population. The varying circumstances facing teachers in the classroom affects the degree to which they are able to apply what is presented in professional development sessions their classrooms.

The current professional development movement to improve teacher quality has been driven by the demand for improved student success. According to Harris, Pollingue, Hearrington, & Holmes, (2014), improved student learning outcomes and teacher performance are the product of professional development sessions. Teachers who work in

poverty-stricken districts realized students were performing low in math and struggled with reading found attending professional development training helped them better understand college and career readiness standards, so they could improve their teaching practices. The key for vocational teachers is to develop their conceptual knowledge. Equipped with procedures and rules to engage students with study skills, teachers are better able to help them understand mathematics concepts (Harris et al., 2014).

Professional development for teachers has been an instrumental tool to support their improved performance (Flynn, 2016). According to Flynn (2016), professional development is used to assist teachers with instructional strategies that best support student learning using college and career readiness standards. Teachers who participate in professional development training year after year have a tendency to excel with lesson objectives, effective instruction, organization, and increasing student achievement. Students who perform at a high level of proficiency at the secondary level will have success in college, career, and beyond (Mangin, 2015).

The expectation for teachers during professional development is to learn new instructional strategies that are up-to-date with current practices. Professional development is designed to deliver new information to help teachers use strategies that actively engage student in learning opportunities (Lin, 2014). The practices that teachers learn from professional development sessions should be geared toward their subject-area content standards. Lin (2014) noted that 75% of students who learn from new practices that teachers implement from professional development training have a long-term positive effect on society. Also, when teachers improve their practice with skills acquired

through professional development training, students are better able take charge of their own learning to close the achievement gap.

Efforts to close the achievement gap in vocational schools using college and career readiness standards is dependent on the growth and development of teachers. According to Leibowitz (2016), teachers who have high standards and high expectations are those who strive to become experts in their practice. Teachers hold responsibility for being productive in a way that allows students to connect what they are learning to real-world applications. Professional development prepares teachers to formulate questioning techniques that requires students to use critical thinking to solve complex issues—key elements of college and career readiness (Dennis & Horn, 2014). Teachers who consistently participate in quality training work smarter and begin to eliminate ineffective practices, which in turn helps to close the achievement gap (Milburn, 2015).

Implications

Effective teaching practices are essential to the growth and development of students' academic success. This study emphasized the local issue of untrained vocational teachers who lack adequate skills to teach math using effective instructional strategies so that students are able to acquire skills needed to pass ACT WorkKeys. This project study provided research in this area. The literature review addressed several topics related to teacher effectiveness, including teacher turnover, professional development, professorial learning communities, standardized test, and college and career readiness standards that require attention to address the local problem.

Summary

This project study addressed the local problem of untrained vocational teachers who lack adequate skills to teach math. There is research available to suggest strategies to improve vocational teacher's math skills. The objective of this study was to discover effective strategies for vocational teachers at Gump Vocational School. A research question was formed to discern eight vocational teachers' perceptions about the current training strategies at the school and what they believe is required to meet academic goals. This study was guided by qualitative research design used to gain deeper understanding about what strategies could be implemented to improve math instruction and ultimately student outcomes. Section 2 will discuss the methodology used for this project study and the study findings.

Section 2 will describe how the research was designed based on the local problem and overarching research question. The section includes discussion of qualitative research design and explains why qualitative research is appropriate for this study. This section includes a description of participant selection and ethical measures used in the study. The methodology section also features a detailed description of the data collection process and data analysis along with findings of the research. Section 3 will discuss the project and Section 4 will provide information about reflections and conclusions.

Section 2: The Methodology

Introduction

This qualitative case study involved an exploration of the perceptions of untrained vocational teachers at Gump Vocational School about training to teach math. Use of a case-study design allows researchers to examine individuals at a particular time or place (Creswell, 2012). In addition, researchers using a case-study design may obtain results that can be used to improve current situations (Borell de Araujo & Franco, 2017). Untrained vocational teachers who participated in this study provided descriptions of their perceptions of the best approach for improving vocational teachers' math instruction. The following research question was used to guide this study:

RQ: What are vocational math teachers' perceptions about their knowledge and use of instructional strategies for teaching math?

The following two subquestions facilitated addressing the overarching question:

SQ1: What are vocational math teachers' perceptions of the current training received to teach math to students enrolled in Gump Vocational School?

SQ2: What instructional training do vocational math teachers believe should be offered to enhance the instructional skills needed to improve academic performance?

Research Design and Approach

For this study, I considered whether a qualitative or quantitative approach would be best. Qualitative research may be best used to address a problem with no known variables (Wright, 2016). Quantitative research design provides data in a numerical format (Wright, 2016). This study was not conducive to consideration of statistical data.

Instead, I relied on the perceptions of teachers about ways to improve teaching practices in math at the target school. In contrast to quantitative research, information provided through qualitative research might lead to information about a phenomenon. The participants in this study expressed their perceptions about the local problem of vocational teachers' inadequate training to teach math effectively, which was the phenomenon under study. The central phenomenon is the main idea or reason to conduct the research (Lee & Schallert, 2016). For this problem, a qualitative case-study design provided the best approach because numerical data could not have elucidated teachers' perceptions about current training to teach math.

Within the realm of qualitative inquiry, researchers can choose from several different approaches such as narrative design, grounded theory, phenomenological research, and ethnographic design. A narrative approach is used to express the ideas of individuals based on their experiences (Conover & Daiute, 2017). This approach enables researchers to tell a story related to the problem being studied. The researcher makes an observation of the lived experiences to be used for data analysis (Conover & Daiute, 2017). A narrative approach is designed to describe and interpret the behaviors of individuals based on their lived experience and is presented via storytelling (Creswell, 2012), an approach that did not suit the goal of this study.

Researchers using a grounded theory design develop a theory from people who are involved with experiences of a process (Charmaz, 2017). Grounded theory researchers concentrate on individual participants who are assisted with the development of a theory to explore data (Charmaz, 2017). A grounded theory approach offers an

opportunity to formulate theory aimed at understanding the essence of a central phenomenon; however, the goal of this study was not to develop a theory to understand the perceptions of untrained vocational teachers for math. For this reason, I decided against using a grounded theory design for the study.

Phenomenological researchers examine the significance of more than one individual's lived experience (Tonga, 2016). This type of research allows the researcher to draw conclusions about the phenomenon from participants' descriptions of their experiences. Phenomenological research provides an approach for understanding the problem through the experience of others (Tonga, 2016). Phenomenology was not the right approach for this study, the focus of which was on examining perceptions, rather than experiences, of others.

Ethnography provides another approach to qualitative study. For ethnographic design, researchers study one group's values and beliefs (Creswell, 2012). Ethnographic researchers look for patterns within the culture. Participants in ethnographic research are involved in cultural experiences for an extended period, so they can internalize the experience by assimilating into the culture. Researcher focus on behaviors to describe outcomes (Creswell, 2012). Because ethnographic research produces findings based on the exploration of patterns within a culture rather than the perceptions of participants, ethnography was not the right match for this study.

Researchers using a case-study approach examine a problem among a single case or multiple cases in a restricted system (Borell de Araujo & Franco, 2017). In this study, I focused on one case, which I examined through participants' in-depth responses to

questions aimed at providing specific information about the central phenomenon. One-on-one interview sessions offered the opportunity to ask questions of the participants. Data collected from participants and recorded in a journal served as the basis for discovering recurring themes and pattern in participants' responses.

Participants

      Criteria for selection of participants. The local school district's superintendent provided permission to conduct research at Gump Vocational School. Participants from the school were eight vocational teachers who had vocational certificates but did not hold a regular teaching credential. I interviewed them to gather data about what support they need to . be effective in the classroom. The selected group of teachers possessed expertise to teach in their area of specialization or skill but had not received adequate training to teach math.

      Justification for the number of participants. The sample included eight secondary vocational teachers at the school under study. This number of participants provided sufficient depth for addressing the research program and achieving the study's goals. According to Creswell (2012), qualitative researchers typically study only a small number of individuals; for this study, eight teachers participated. The goal is to gather detailed information to be presented in the findings

      I used purposeful sampling to select participants from Gump Vocational School for this study. Purposeful sampling allows researchers to select participants based on their knowledge, so the researchers can learn more about the local problem (Ford, 2016). The selected teachers held career tech certificates, which are noncertified certificates to teach

in a content area of math. I did not know the participants prior to the study, so there were no apparent conflicts of interest (e.g., being their supervisor or being in a position to delegate responsibility to them).

Qualitative researchers focus on using an investigative approach to gain a better understanding about a particular problem or topic, rather than to measure something. According to Wright (2016), qualitative research is broad and includes inquiry to gain a better understanding about a particular event or individual. After receiving approval from Walden University's Institutional Review Board (IRB approval number 05-01-18-0535715), I e-mailed consent forms to the prospective participants to complete and return within 5 days (see Appendix B). Individuals who returned the consent form became participants in the study and received an e-mail notifying them of their acceptance. To establish a relationship with each participant, I provided background information about myself and explained the study to them. Establishing a relationship with the participants is critical to the research process (Flick, 2014).

Procedure for gaining access to participants. The interviews took place at times and in locations agreed on with each individual participant. These locations provided quiet, comfortable settings that were free of disruptions and protected the participants' confidentiality. Flick (2014) noted that a comfortable setting can contribute to a more relaxed interview session. After we agreed to a time and location, I sent notices to the participants reminding them about the meeting details, the purpose of the study, and the reason they were selected. During each interview, I asked questions about the local

problem of vocationally trained teachers who lack adequate preparation to teach math.

Each interview session lasted approximately 60 minutes.

I developed all necessary consent forms and letters in a manner consistent with Walden University standards and guidelines (see Appendix B). The information in the documents explained each party's role, provided background information about the study, and explained measures for protecting participants' confidentiality and well-being. The ethical behaviors outlined in these documents represent standards for doing what is morally correct with others (Stankiewicz & Lychmus, 2016). Specifically, these standards are intended to ensure that participants incur no harm from their role in the study (Stankiewicz & Lychmus, 2016). As the researcher, my role was to protect confidentiality and privacy among the participants (see Hampton, 2016). All data gathered were secured using an electronic database that is password protected. Rather than use participants' names, I identified participants by using the labels VCT1, VCT2, VCT3, VCT4, VCT5, VCT6, VCT7, and VCT8.

The aim of qualitative research design is to gain a deeper understanding about the study from the participants selected (Berger, 2013). To meet this goal, deep inquiry concerning the local problem is required (Berger, 2013). Purposeful sampling provided an approach for garnering participants who could elucidate the problem.

Purposeful sampling adds credibility to a small sample size to reduce judgement within a purposeful category (Benoot, 2016). According to Creswell (2012), when using purposeful sampling, researchers intentionally choose individuals and sites that contribute

to understanding the topic of study. The sample included teachers at a school that has existed for five years.

Role of the Researcher

The prospective participants included vocational teachers at Gump Vocational School. I contacted all prospective participants with a letter of invitation to participant in this study. The individuals who decided to participant received a consent form within 5 days. The consent form addressed information about this study, confidentiality, benefits, and the voluntary status. The participant had 7 days to return their consent forms. I scheduled one-on-one meetings for each participant, which were confirmed with an email. During the interviews, I clarified the importance of the participants' role in the data collection process. I developed a list of questions focused on the lack of teachers adequately trained to teach math (see Appendix C). I used a journal to take notes during interviews, and then reviewed those notes to look for patterns from the data collected. I audio-recorded each interview session using a handheld recorder with speaker and playback button to ensure accuracy of responses.

My role as the researcher in this study extended to maintaining rigor and credibility of the research. My objective was to ensure I addressed the reliability of the study by monitoring and reducing bias, developing confidence in the methodology, collecting data, analyzing data, and presenting the findings. As the researcher, I explained the study in a narrative format without bias, made appropriate field observations, conducted interviews properly, addressed data according to the design, and analyzed the data with competence.

First, I self-assessed my competence by demonstrating a level of understanding with a local school official who has knowledge about analyzing qualitative research. I practiced for the interview sessions by rehearsing the welcome, greeting, and background information about the study, obligations, benefits, and risk. I also ensured I could clearly and easily articulate each research question before the interview process began. I solicitated feedback from a mentor to ensure my competence, and I sought video presentations on how to conduct interviews to gain additional knowledge about effective interview techniques. Once I gained confidence in my ability to conduct interviews, I began data collection.

Data Collection

Interviews. Interviews took place according to each participant's selected schedule. They were completed within a 4-week time frame. Each interview session lasted about 60 minutes to allow participants to share their responses without feeling pressured. I recorded interview data using a handheld audio recorder and transcribed each interview. I also took notes in a reflective journal. For all participants, I reviewed the purpose of the study, reminded them that the data they provided would be held in confidence, and reinforced that their participation was voluntary and that they could discontinue their involvement at any time for any reason with no recourse. After the data were collected, I organize the electronic data in files in a secure location on my personal password-protected computer. All tangible data, such as journal entries were stored in a lock box in the basement of my home and will remain there for 5 years and then destroyed.

The purpose of a researcher using a qualitative approach is to design, interview, transcribe, analyze, verify, and report findings (Fink, 2015). Participants for this study provided responses using an instrument that featured a list of questions that aimed to elicit information about math teachers in the local setting who were not adequately prepared to teach this subject. (See Appendix D). Participants received information about all assumptions associated with the study and had the opportunity to make certain information collected was accurate.

As the researcher, my involvement comprised purposely selecting participants, conducting one-on-one interviews sessions, transcribing data, analyzing data, and presenting the findings. By using purposeful sampling, I was able to gain a specific understanding of the problem by looking for themes and patterns within the data (Creswell, 2012).

My interest in the local problem of vocationally trained teachers who are not adequately trained to teach math arose because of my knowledge that students were performing low on ACT WorkKeys for math. My desire with regard to the central phenomenon was to question the participants to decide the best approach to improve instructional strategies of vocational teachers in math. I used member checking for accuracy and credibility. I checked the responses of the participants to ensure they were accurate. According to Creswell (2012), "Member checking is a process in which the researcher asks one or more participants in the study to check the accuracy of the account" (p. 259). My current position is a school counselor within the school district,

with the aspiration of becoming a school administrator. I am not a counselor at Gump Vocational School.

Data Analysis

After collecting the data, I analyzed the data collected from the one-on-one interviews during the data collection process. I read the information transcribed in my reflective journal and listen to each recorded session. I reread the overarching research question to ensure that the participants' responses are aligned with the question. I analyzed the data to look for recurring themes. According to Creswell (2012), recurring themes express an idea that can be used to develop meaning. I coded the themes that emerged to help categorize the data. The patterns that will be identified will help summarize the information.

Data Analysis Results

Data for this study were gathered by conducting one-on-one interviews sessions with each participant. Interviews provided information about a specific topic (Guest, 2017). The data were recorded and notes were transcribed in a reflective journal for accuracy. The data were examined to identify recurring themes and patterns. The rereading of the information provided clarity and understanding. Then I listened to the recorded sessions of the interviews to make sure what I had written matched what was recorded. The information was categorized and organized into themes using codes to identify a specific pattern. The participants' feedback provided information to address the guiding research question: What are vocational math teachers' perceptions about their knowledge and use of instructional strategies for teaching math. This question was

addressed using two subquestions, and findings related to the subquestions are addressed below.

Research Subquestion 1

What are vocational math teachers' perceptions of the current training received to teach math to students enrolled in Gump Vocational School?

Findings for SQ 1. The vocational math teachers at the school under study mentioned professional development, common planning, benchmarks, real-world application, and a professional learning community would best support vocationally trained math teachers to help improve student performance on the ACT WorkKeys. The teachers also mentioned that their technical training in their field of education did not focus on math education and did not afford them an opportunity to acquire skills to become math experts. VCT1 said, "I did not go to school to be a math teacher. I have been trained to prepare students on how to become electricians."

VCT1 stressed that professional development learning opportunities that the local school district offers do not favor vocationally trained math teachers nor do they offer enough training sessions. VCT1 stated, "The little help that we received comes from self-motivation." VCT1 expressed that the district has failed vocational math teachers and the students they teach because vocational math teachers are not skilled enough to teach math at a level at which student performance can increase. VCT1 indicated concern that vocational students in the district will continue to fall behind academically if vocational teaches are not adequately trained.

VCT1said for instructional practice of vocational math teachers to improve, teachers need to receive continuous professional development to meet the various learning styles of students. There was no mention of content or instruction from this teacher. The local school district typically schedules professional development sessions after school or on the weekend. VCT1 indicated the school district should arrange for a stipend to be paid to ensure vocational math teachers participate in the training sessions to improve instruction. VCT1 indicated that by incentivizing ongoing participation in professional development, student's achievement may improve throughout the course of the year.

VCT2 indicated the current training vocational math teachers receive is an indication of poor planning on the part of the local school district's officials. This teacher has aspirations of leading professional development sessions and indicated professional development will be critical to her personal and professional growth as a teacher. VCT2 said, "The more involved I am with professional development activities the better I will become with my instructional practices." She also stressed that student achievement will improve as her participation in training sessions increase. According to (Korthagen, 2017), professional training improves the quality of instruction because knowledge and experience increases. Teachers will need to become active participants in professional trainings to determine what instructional practices will work best to improve academic performance.

VCT2 discussed implementing a professional learning community (PLC) to support training. A PLC is used to enhance teacher learning and build capacity for

student learning (Hairon, 2017). PLCs provide teachers the opportunities to meet on a regular basis to address lessons, monitor student progress, share experiences, and create new ideas for improving the overall quality instruction. VCT2 said he strongly believes teacher need support to be successful. VCT2 said, "Teacher should invest in their craft in order to become effective in the classroom." He said he understands the connection teachers have to make between instruction and student learning. He also understands that active participation among student is important to the learning process. VCT2 mentioned a PLC offers math teachers the chance to work as a team and complete a self-assessment as a result of the planned meetings and then use that information to enhance instruction.

VCT3 talked about an approach to improve training opportunities to meet the instructional needs of vocational teachers who teach math. VCT3 said professional training should focus on understanding math standards and developing lessons to address student's learning deficits. VCT3 said, "Real-world application is needed in lessons to demonstrate to students the relationship math has in everyday life." Real-world application is beneficial to students as they develop skills for employment (Belland, 2013).

VCT4 explained that training needs to allow teachers the opportunity work collaboratively to review math standards, develop lessons, plan for activities, and model instruction. She believes this strategy will allow teachers the chance to be engaged in teaching and become more familiar with the expectations of providing effective classroom instruction. The concept of interactive training sessions creates an experience teachers can rely on in the classroom. VCT4 said, "I learn best when I am able to practice

and participate in the activity. A professional training with all lectures will not transition me to become better with instruction." She said learning by doing provides instruction that helps her become more successful with classroom instruction.

VCT5's perception of the training sessions is that they lack focus needed to prepare vocational math teachers to help student perform better with testing. He believes that professional training sessions should be offered on an on-going and continuous basis to support instructional strategies. VCT5 said, "The only way to improve test scores is to provide professional development for vocational math teachers who need additional support with instruction. This can be done by using collaborative planning and peer collaboration." He also favors an approach of allowing teachers to observe one another teach lessons throughout the year. These peer observations would provide opportunities to identify strengths and share ideas. According to Kelly and Cherkowski (2017), peer collaboration gives teachers opportunities to engage in dialogue, so better practices are identified and implemented to improve lessons. This strategy may be necessary to change the dynamics of professional learning.

VCT6 was an actively participated in the small amount of training the school district has provided for vocational math teachers but said it was ineffective. VCT6 focused on the presentation and the materials associated with the training sessions. VCT6 said, "I realized the presenter did not address the vocational teacher's level or experience with teaching math. In this particular training, the presenter assumed we were all at the same level in terms of experience and ability." VCT6 further explained it would have

been important for vocational math teacher to introduce themselves and provide background information about them.

VCT6 indicated the small amount of training he did receive was not effective in improving his practice in teaching math. In an effort to improve training and equip vocational math teachers with skills needed to be productive in the classroom, VCT6 indicated that vocational math teachers need to plan together. VCT6 said, "Common planning would lead us to working collaboratively, so our progress is not stagnating." He also said he believes the success of the team will be the success of the vocational math department. According to Kelly and Cherkowski (2017), common planning is a way to ensure teachers have an opportunity to plan for strategic lessons. This practice will allow vocational math teachers to work together to improve student performance.

VCT7 believed the best approach to developing vocational teachers' math skills would be through peer collaboration. VCT7 said, "The best way to improve our practices is to participate in planning sessions that requires us to develop lessons. This would also involve us in being creative with activities and implement other math teachers' ideas." He stressed the fact that vocational math should create a culture and community that exemplifies to other departments that they are working together. In an effort to join each other in this group, VCT7 said, "We must trust in the process as we make plans to improve our teaching practices." He also explained that professional development training creates opportunities to build relationships among vocational math teachers.

The instructional practice of vocational math teachers may improve as they continue to provide instruction from year-to-year—in other words, the more teachers are

involved in their practice, the better they will become. VCT7 said, "The leadership of the administrators has helped some with building confidence. The main goal or objective is to become effective in my practice." The instructional leaders provide immediate feedback from observations. The strengths and weaknesses of the lessons are identified with instruction to improve the weaknesses for the next observation. VCT7 mentioned this part of professional development has been beneficial on a limited basis because observations are not done frequently. He believes weekly observations would help more.

VCT8 pointed out that the first step is for vocational math teachers to have an understanding why they have not been effective classroom teachers. VCT8 also perceived that the current training sessions do not benefit vocational teachers because their area of expertise in not math. VCT8 said there should be a relationship between local school district officials and teachers as it relates to content development. VCT8 also said, "A cohesive unit should best serve professional training as we build capacity to meet the organization goals of the school." As a result, the quality of instruction may improve student performance.

VCT8 discussed in the interview session that vocational teachers could also lead training sessions, so evaluators could critique their lessons. VCT8 also realized that lesson planning and activities are important to student learning and emphasized the importance of understanding lack of training in these areas are a key reason why vocational math teachers need training support to become better teachers. Professional development will give the teachers multiple opportunities to establish themselves in the classroom by sharing lessons and idea on how to improve teaching strategies. VCT8 said

enhanced training in how to plan lessons and implement activities should be a schoolwide project for all content areas, not just math.

Summary of findings for SQ 1. Seven of eight participants mentioned that professional development is needed to improve the instructional practice of vocationally trained math teachers. The participants believe more professional training would be vital to their success in the classroom. VCT1, VCT2, VCT3, VCT4, VCT5, VCT6, and VCT8 all agreed that professional development would be essential in how they plan, prepare, and deliver instruction. VCT7 believed that the preparation for classroom instruction should come from a student's college course work. VCT7 said, "It is the student's responsibility to obtain all the necessary skills needed to teach while in school." Better preservice preparation would enhance teachers' teaching ability and help them benefit more from in-service professional development for vocational math teachers. VCTs 2, 4, 5, 6, and 7 all talked about the importance of collaborative practices, such as PLC, peer observation, and common planning.

Findings indicate that vocational math teachers saw the opportunities for professional development as inadequate. In talking about the current training provided, participants generally talked in terms of what they needed but was not provided by the limited training they received. Based on participant responses, a professional development policy for vocational math teachers that requires ongoing training, provides hands-on learning opportunities, and supports collaborative practices would be useful in helping to develop vocational math teachers' instructional skills. According to Messman

et al. (2017), vocational teachers will benefit from hands-on learning because much of their training is relative to a specific vocational skill.

Research Subquestion 2

What instructional training do vocational teachers believe should be offered to enhance the instructional skills needs to improve academic performance?

Findings for SQ 2. The participants at the local secondary vocational school disclosed that vocational teachers need to be exposed to real-world applications. This concept will connect students with ideas and application needed to become productive citizens. According to Puliatte and Ehri (2018), real-world exposure provides authentic experiences that lend support to relative outcomes. VCT1, VCT4, and VCT7 believe the interaction with real-world concepts prepare students for everyday life.

VCT1 mentioned students should receive instruction that is specific. VCT1 also said, "Questioning technique is critical to understanding the lesson being taught." This teacher strongly believes that asking questions that allow students to think critically helps develop their cognitive skills. VCT1 said, "Teachers should ask higher-order thinking questions that begin with how and why." VCT1 indicated that vocational math teachers need additional practice and support to enhance their questioning skills.

VCT2, VCT4, and VCT8 suggested active participation is important to improve student performance. VCT2 said, "Students are actively involved in the lesson when they are assigned roles." Erwing and Ahn (2017) noted that students are more successful with academic performance and improve their basic skills when they participate. Active participation has translated into an increase in student outcomes on assessment and boosts

the confidence in students. VCT4 and VCT8 both used technology to support struggling math students. The frequent use of technology keeps the student involved with math concepts and helps students to solve math problems. These three teachers indicated additional training in how to incorporate active participation would help them improve their instruction and students improve their math skills.

VCT5 talked about the opportunities she uses to build on what students already know. This teacher explained how she accesses prior knowledge to gain an understanding about the student's background. VCT5 said, "Once the background information has been shared, I will develop my lessons based on the student's academic level. I also have grouped them according to their ability." Grouping students by ability allows the teacher to address the students' learning needs, monitor their progress, and provide the appropriate assessment to identify academic growth. She indicated this format has provide the insight needed to build a stronger foundation in math and could be helpful for other teachers as they work to improve their practice.

VCT3 focused on understanding the standards that are associated with math. This teacher mentioned that there should be a detailed workshop on addressing standards and how to use them to develop math lessons. VCT3 said, "It has been a difficult challenge to develop standards-based instruction without truly understanding the standards. I wish someone would have taken the time to show me how to best use this." This teacher has relied on her own knowledge and ways to develop the best lesson possible. She indicated that opportunities to work with other vocational math teachers to help her gain a better understanding of the standards would be beneficial.

VCT3 would like for all math teacher to work together and share ideas on how to best use standards-based instruction. VCT3 suggest that collaboration among the teachers would be the next step needed to show academic growth on the ACT WorkKeys in math. She said a collaborative concept would guide the teachers' thinking and lesson planning, so that there is a collective effort to get students to succeed in math.

VCT6 said Gump Vocational School should offer in-house professional development to ensure training is continuous throughout the year. This opportunity would provide vocational math teachers the chance to participate and share in the math community the strategies demonstrated during training. VCT6 also said, "This will create a culture and climate that is conducive to improving instructional practice. All the math teachers will have a chance to meet and discuss strategies presented from the training and implement them into our daily lessons." According to Puliatte and Ehri (2018), teachers who are trained at their work site develop a strategic approach to instructional strategies to enhance learning. This concept may be viewed as a means to provide a systematic approach to professional learning.

VCT7 had a different view from VCT6. VCT7 believed that professional development training is best developed away from the assigned work site to enhance instructional skills. VCT7 said, "In my experience, teachers are too comfortable when a professional training takes place at the work site. There should be more opportunities for us to attend conferences away from here. This way we will be afforded the chance to share information and ideas with teachers in other counties and states. Then we can come back and share amongst the math teachers." According to Epstein and Willhite (2017),

professional conferences help with the development to presenting and planning which develop skills to fully engage in instructional practice. Professional conferences also may equip teachers with skills needed to connect with students.

VCT8 stressed that vocational math teachers have often been overlooked when it involves training. This teacher mentioned that it is her belief that the school's instructional leader can do more to incorporate planning activities to improve academic performance. VCT8 said, "The first thing that needs to be done is thorough evaluation of vocational math teachers' strength and weaknesses. There should be immediate feedback within three days after the evaluation. This will keep the teacher informed, so they can address any issues. The second thing should be scheduled sessions to address math standards, test scores, and proper planning. This will allow teachers the chance to improve their practice. The final step to improving instruction is to complete weekly observations to measure teacher growth and development." VCT8 said the idea should be to work together, so students, teachers, and the school are successful academically. This approach would help build a community among math teachers to achieve the overall success of the school.

Summary of Findings for SQ 2. The vocational math teachers all stressed various ways to train, so their instructional skills can be improved to teach math. Key concepts addressed include use of real-world application, questioning techniques, active participation, and technology. The vocational math teachers also explained that professional training is essential to their growth and development. According to Rieger (2017), teachers who participate in professional trainings gain valuable information that

helps support instruction. The belief is improved instructional practice will enhance teacher effectiveness.

The responses gathered from the research participants suggest the need to use a variety of strategies to improve academic performance. The use of a variety of strategies will allow teachers to address the different learning styles of students. Cuevas and Dawson (2018) mentioned that teachers should plan their instruction to meet the needs of students individually and a group. Ideally, as teachers become better at delivering instruction that is appropriate for each learning style, student achievement will improve.

Accuracy and Credibility

Accuracy and credibility are two components that are critical to the data analysis phase (Cramton, 2015). To ensure accuracy and credibility for this study I followed guidelines provided by Walden University's IRB. I used member checks for validity in this study. According to Creswell (2012), member checking is used to ensure validity in qualitative research. Member checking is a technique used to allow participants the opportunity to verify the responses given during the interview session are accurate (James, 2016). Participants reviewed findings related to their responses and clarified their responses as needed.

Discrepant Cases

Data collection included interview notes and researcher reflection. Using these different approaches helped create triangulation. All of the data collected fell within similar parameters. There were no discrepant cases for this study. This triangulation enhances the study's credibility through the recurrent appearance of similar themes

(Creswell, 2012). According to Creswell (2012), triangulation ensures the data being presented from individuals describes a theme in qualitative research.

Summary

The research provided information about untrained vocational teachers' perceptions of instructional strategies for math. A qualitative case study approach allowed for gaining a deeper understanding of the participants' views. Qualitative case study design positions the researcher to ask questions in an interview format and collect data about a particular event or activity (Creswell, 2012). Purposeful sampling offered the best approach for identifying potential participants. This type of sampling allows the researcher to purposely select the individuals who may participant in the study (Creswell, 2012). The data that is collected from the participants were transcribed in a reflective journal and audio recorded. The data were analyzed to check for patterns or themes to ensure credibility of the study. Findings showed that teachers at the study site need professional development, specifically a district policy ensuring that vocational math teachers receive professional development training, common planning time, participation in professional learning communities, and support in understanding the math objectives they are expected to teach to ensure their continuous improvement.

Section 3 of this paper reflects the findings and the development of the project associated with the research study. The findings, presented in a narrative form, answer the research question and related subquestions. This section also includes explanation of how and why the related project is meaningful for the future of the study site. Section 4 provides conclusions and reflections for this project study.

Section 3: The Project

The purpose of this study was to examine the readiness of vocational math teachers to teach math and tools needed to help them improve their math teaching skills, and ultimately students' test scores in math. My goal was to create a project based on this research that will support vocational math teachers in providing better quality math instruction that consequently helps math students improve their skills. Findings for this study indicated that noncertified math teachers at Gump Vocational School believe they are not adequately prepared to teach math content and need additional support to help their students achieve appropriate standardized test performance to support college readiness. Currently, the district in which Gump Vocational School lies lacks a specific policy to help vocational math teachers improve their math teaching practices, and consequently student math performance. Participants in the study suggested training is necessary to improve student performance.

Overall, participants indicated that they need professional development to help improve their instructional practice. They indicated that professional development is essential to helping them better plan, prepare, and deliver instruction. Participants stated that vocational math teachers need opportunities for using collaborative practices, such as PLC, peer observation, and common planning, as well extensive, ongoing training to improve their math teaching skills and help students achieve higher standardized test scores in math.

Through one-on-one, semistructured interviews participants in the study expressed their concerns about their preparation to teach math and suggested approaches

for improving their math teaching practice. Professional development was the desired approach among the vocationally trained math teachers in the study for improving instruction. Key themes that emerged related to this call for professional development include leadership support, training opportunities, and common planning time. The first step in helping the participants improve their math-teaching practice is developing policy that establishes improving vocational math teacher skills through professional development as a district priority. To address this need, the project associated with this project study is a policy paper that school officials can use as the basis for creating district policy aimed at fostering improved teaching practice among vocationally training math teachers.

The instructional leaders and local school officials need to make a collaborative decision to ensure quality trainings are scheduled. Those responsibility may include the principal, professional development director, and the district's math coach. The goal of the project is the share information with all stakeholders so that there is ongoing professional training during the academic year. Vocationally trained math teachers who receive such training should have a better understanding of math standards, lesson planning, activity development, and instructional strategies, and assessment practice, which should help them to become more effective teachers.

Rationale

To help solve the local problem, I created a policy paper because the school district does not provide appropriate professional development training for vocationally trained math teachers and no policy exists to ensure that these educators receive the

support they need to improve their math teaching skills. An evaluation report was not appropriate because, based on my interviews with the vocational math teachers, there was no current professional development program for vocational math teachers to evaluate. This study focused on teacher needs, not student learning, so a curriculum plan focused on a detailed unit of study would not have addressed the local problem. I could have created a professional development training program to meet the requirements for this project study; however, providing a single training session would not have sufficiently addressed the problem.

Vocational math teachers at Gump Vocational School need comprehensive and ongoing training, and creating a policy requiring such training will help ensure teachers' needs are met. Providing a one-time training program could help vocational math teachers who attend improve skills related to the training provided, but a single training program would not be sufficient to compensate for the lack of math education training among vocational math teachers. The problem of inadequately trained vocational math teachers is a perennial problem, and one-time professional development would not provide training for future vocational math teachers, would serve to perpetuate the problem. Vocational math teachers indicated that to fully address the problem of lacking adequate training to provide effective math education, they need comprehensive and ongoing professional development. Given that my review of district policy showed there is no mandate for vocational math teachers to receive professional development opportunities outside their vocational specialty areas, the district needs to commit to a

policy of providing ongoing, systematic, math-related professional development for vocational math teachers, rather than providing a one-off training session.

Creating a policy paper provided a means to ensure that vocationally trained math teachers' professional development needs will be met not just in the short term, but on an ongoing basis. I believe that all stakeholders need to gain a better understanding of how frequent use of professional development training can help improve teaching and subsequently academic performance at the target school. The policy document created for the project portion of this study should help to ensure school instructional leaders provide the professional vocational training math teachers need by making it a district priority.

A policy paper may be referred to as a research-based document that addresses a policy and provides recommendations. According to Stelzner (2013), a policy paper is used to persuade, explain, and suggest change for a potential problem. Lumby (2014) conducted a study that addressed changes in school leadership and curriculum using a policy paper. The purpose of the policy paper developed for this project study was to create awareness of the lack of training opportunities and convince stakeholders to make critical changes to improve vocational math teachers' instructional skills. This policy paper provides information about professional development and why it should be used frequently.

To implement the policy, the superintendent and professional development director will need to create an overall plan, to include deciding on the time, dates, and location of the scheduled trainings. They will also need to create a plan for ensuring school-based initiatives such as PLCs and common planning time are implemented.

Having a policy in place would help ensure that every education professional is well prepared, resource-supported, and effective. In addition, a carefully planned training session adds to the accountability of the policy. A substantial amount of research suggests that policy papers on professional trainings can influence people to participate in meaningful discussion (Stylianidou et al., 2018). Recommendations in this policy paper provide a foundation for addressing the problem by elucidating the types of support vocational math teachers believe would help improve their practice, as indicated by research findings. A policy paper was the best approach to provide information to the local school officials in the district. The findings provide the basis for suggestions to improve instruction. A conclusion of the study is that all stakeholders must gain a better understanding of the utility of providing vocational math teachers with frequent professional training to improve academic performance at the target school. Having vocational math teachers not only attend training but share knowledge gleaned from the training with other teachers is an important step for the school's instructional leaders to take. The policy paper provides information to help local school officials understand the problem faced by vocational math teachers and implement solutions.

I designed the policy paper to accommodate the needs of teachers who have not had appropriate training to teach math courses in a vocational school setting. In the paper, I share information about the problem, analysis of data, summary of findings, and recommendations to consider for implementation. The recommendations also suggest the next steps that need to be taken for effective use of the findings. The conclusion

addresses the overall goal; thus, there is some action step taken to improve the current situation. This policy would support struggling vocational math teachers.

Review of Literature

In this study, I examined vocational math teachers' lack of the skills needed to ensure adequate student performance in math based on standardized test scores. Participants in the study indicated that they needed additional training to successfully teach math skills to their students. The district's current policy requires that vocational teachers receive professional development related to their primary teaching responsibilities. For example, a business education teacher completes professional development in business while an electronics teacher would complete professional development in electronics. This professional development training is likely to be continuing education required to maintain professional certifications in a particular career area. The school district does not have policy that requires vocational teachers to complete professional development related to math education. Vocational math teachers are primarily responsible for content that is in their specialized instructional area, which is vocational in nature. They must also be able to teach math concepts embedded in their content, which requires a solid understanding of how to teach math concepts so their students can acquire math skills needed in higher education and the workplace. Based on the findings of the study, I believe providing one-time professional development will not be sufficient to address the problem at the study site. For sustainable change to occur, the district must adopt policy that establishes a continued commitment to ensure vocational math teachers receive the training they need to teach math concepts. Thus, the project

related to this study is a policy paper that encourages the district to implement three policies that will support the ongoing professional development of vocational math teachers.

The literature review includes examination of several key areas related to the project. To establish the structure for the project, the review includes a section on policy papers. Because this policy paper focuses on math education, the next section is about understanding math standards. The project focuses on three policies: requiring school leaders to provide information evaluation to vocational math teachers, so they are aware of areas requiring improvement: providing professional development training, so that teachers can gain needed skills; and creating professional learning communities, so teachers can support each other in gaining needed skills. Literature related to each of these policies is addressed in a separate section on the literature review. This literature review also reflects the information used to develop this project.

Sources used for locating relevant literature included PROQuest, Google Scholar, Academic Search Complete, ERIC through Walden University Library. Search terms included *professional development, professional learning community, formative and summative assessment, math standards, and common planning*. Information cited in this literature review came from peer-reviewed sources published within the past 5 years.

Policy Paper

A policy paper was developed to recommend policy options to the local school district officials about professional training sessions as strategy to improve instruction. A policy paper has been known to present findings and solve a problem that exists (James,

2016). I have addressed the local problem and listed some recommendations to solve the issue. The idea of a policy paper for this project was based on findings of the research related to this study. Findings from the project study research, which indicated that vocational math teachers at the site need professional development training, common planning, PLCs, enhanced skills for using formative and summative assessment, and increased understanding math standards, inspired the idea of creating a policy paper to help ensure teacher needs were met. Literature indicates professional development for teachers has increased and refined instructional strategies that are required to teach content, critical thinking, and problem-solving skills to students (Taylor et al., 2017). To produce improved performance, professional development has to be effective. Effective professional development may be defined as structured learning to influence change to teacher practices and improving student outcomes (Taylor et al., 2017). This approach can be linked to the curriculum that correlates to the district's policy for using the framework and pacing guide to plan lessons.

Findings from this study indicated participants needed professional development to help them gain knowledge needed to successfully teach math skills, yet a single professional development session would not be adequate to create long-term improvement in teacher's ability to teach math. A policy paper can be used to focus on a specific policy, offering clear recommendations, so policy makers can make a conscious decision about a needed change – in this case implementation of ongoing professional development for vocational math teachers (Ibeh & Lloyd–Reason, 2017). The information in this policy paper provides meaningful ways to improve the problem of

vocational math teachers at the school being inadequately prepared to teach math concepts to students. According to James (2016), school officials are the main stream to adopting and enforcing new policies for the district. The vocational teachers who agreed to be interviewed in this study have a direct effect on implementing change (Appendix A). The completion of the interviews allowed the opportunity to analyze the data to develop this policy paper. Findings from the study informed this policy paper. The paper has information that may be helpful for improving the performance of vocational math teachers at the study site.

The policy paper, written for the benefit of stakeholders in the district, features a description of the specific professional development approaches that teachers indicate would help them improve their instruction in math concepts. Professional development is a training session used to focus on a specific concept to improve the education process (Stelzner, 2013). The education process can be in the areas of leadership, curriculum, teaching, or assessment. This policy paper suggested recommendations for policy implementation.

The project document in Appendix A will be used to share information about the suggested recommendations on professional development. These recommendations focus on polices needed for continuous training to enhance the instructional skills of vocational math teachers. A recent study revealed policy papers can be effective for a particular group of individuals (Harding, 2017). The policy paper will be helpful to educators at the target school and perhaps other vocational educators. In addition, a policy paper is often utilized to address an issue or concern with an organization (Harding, 2017).

Policy papers are beneficial to organizations when considering making changes. An essential part of a policy paper is the capability to impact personnel who are involved in the decision-making process. According to Yoshida & van de Walt (2018), a policy paper is an instrument used to explain information to specific individuals. This policy paper in Appendix A may be used to address the problem and share recommendations the school.

Professional Development Focus

The frequent use of professional development has been recommended as a strategy to improve the instructional practice of vocationally trained math teachers. The vocational math teachers at the study site are concerned about student test scores on the ACT WorkKeys and the amount of training they receive for professional development. Professional development is a training tool used to maintain professional credentials that involve intense strategies and collaboration among the participants (Kennedy, 2014). Professional training that focuses on teacher-centered activities is beneficial in building skills (Kennedy, 2014).

Professional development is important when skill building exercises are implemented and active participation is part of the process. According to Desimone, Smith, and Phillips (2013), teachers who are actively engaged in professional development sessions often excel in the classroom. Teachers may use professional development opportunities to equip themselves with research-based strategies needed for class instruction. Teachers can use strategic planning to master lessons and activities to increase student achievement.

The evolving process of professional development provides the opportunity for teachers to learn and become more in-depth with collaboration (Timperley, 2011). Many opportunities for teacher collaboration allow for continuous learning, so teachers can develop new ways of working as a team (Timperley, 2011). As they become more adept at working as a team, teachers can develop professionally and transform their instructional practice to support student learning. Professional development will also train the teachers to reflect on their own practice when collaboration is involved (Mitchell & Sackney, 2015). According to Hargraves and Fink (2017), the culture of professional development is designed so teachers are encouraged to have a sense of ownership. The shared experience of professional development trainings may provide opportunities for collaboration that support improving the instructional practice of teachers (Egert, Fukkink, & Eckhardt, 2018).

The collaboration within professional development requires that trust is developed among colleagues. When trust is established, teachers are more likely to engage in professional learning activities so there can be a collegiality to support one another efforts with growth and development (Youngs, 2013). This sense of trust creates an opportunity for teachers to buy-in and talk among each other about their level of professional learning (Youngs, 2013). Youngs (2013) noted that teachers will not openly share their thoughts or ideas when they are not comfortable with the teachers with whom they are grouped.

Teachers' professional growth can be evaluated through peer observations (Bell & Thomson, 2018). Teachers will begin to try new things, use different assessment

methods, and develop a sense of intellect about the knowledge and skills they gained from professional development sessions (Harris et al., 2014). As teachers gain additional skills and knowledge through professional development, they will create a reflective practice that is necessary to determine how much teachers have grown in their development. According to Sunyer et al. (2015), reflecting on their practice allows teachers to extract concepts from the knowledge and experience gained from professional learning opportunities to integrate into their teaching practice. Professional development can offer the structure for teacher engagement in building relationships to reflect on what was learned and to discuss teacher's instructional practices.

The main purpose for addressing professional development is to focus on teachers' professional learning needs in an effort to consistently improve their practice. An emphasis on professional learning should focus on activities and skills that lead to improvement (Flynn, 2016). A shift in teachers' mindset occurs when professional development effects the equity and quality of the classroom (Flynn, 2016). Flynn suggested that professional learning occurs as long as teachers work together to reflect on what they have accomplished.

Professional development training provides formal opportunities for teachers to learn how to improve their teaching practice. Other forms of professional development offer more informal learning opportunities that focus on collaboration.

Professional Learning Communities

PLCs offer an opportunity for teachers to build relationships, work collaboratively, and create a foundation for improving their teaching practice. PLCs

provide of social interaction for teachers as they engage in professional dialogue to accomplish the goals and vision of the school. According to Vygotsky's (1978) social development theory, individuals who participate in collaborative activities develop those intellectual skills needed for cognition. A PLC can help develop instructional practices that may lead to skilled teachers.

Vocational teachers need the opportunity to work together so they can fully prepare for instruction to meet the goals and expectations of the school. In a PLC, teachers share leadership opportunities as they work together to address the mission and vision of the school and improve student learning (Dockery, 2011). Teachers usually gather to devise a strategic plan to meet the overall expectations of the achievement goals.

The literature indicates that teachers should work together to formulate new ideas and gain insight for classroom practice (DuFour, 2004). This practice would be beneficial for vocational teachers, so they can fully understand the basis of achieving the learning goals of the school. An issue associated with PLCs is failure due to misunderstanding among teachers. PLCs may also fail to reach their full potential because teachers do not follow through on the ideas that are shared (Mintzberg, 2014). When teachers do not apply what they learn through PLCs to their teaching practice, PLCs cannot grow and thrive, and a lack of trust and continuity among the teachers may arise. Research has attempted to make sense of the characteristics associated with PLCs, so schools can be effective and be proficient with meeting their academic goals (Mintzberg, 2014).

When PLCs are successfully implemented, they help improve instruction by facilitating sharing among teachers and building awareness of what constitutes effective learning. According to the U.S. Department of Education (2013), continuous collaboration must be a focal point among teachers if schools want to improve instruction. PLCs must establish a climate that values commitment to achieving the school's goal. Teachers within the PLC should use data to drive strategic planning and instruction. PLCs also help support teachers in their efforts to assist students when they are struggling to master standards (DuFour, 2004).

In addition to providing individual formative assessment to teachers, school administrators are instrumental in guiding PLCs, setting clear expectations, and ensuring teachers understand the purpose of collaboration. Administrators should plan to meet with the PLC to follow-up on the planning to determine if the instructional practice is effective and meeting the individual learning needs of students. The scheduled meeting should consist of questions that will affect solutions for curriculum development (Gray, Kruse, & Tarter, 2016). Successful PLC implementation relies on the scope, shared responsibilities, and a strong desire for the administrative team to provide shared leadership (Thomas, 2013).

Teachers in the PLC need to be empowered to focus on the purpose and objectives of the PLC. A successful PLC has the characteristics of developing a positive culture that establishes trust and maintains a level of respect for all parties involved (Thomas, 2013). PLCs should generally maintain the same strategy for 3 to 5 years to

provide a record of progress that can be measured and to ensure the PLC is effective (DuFour, 2004).

According to Gray et al. (2016), teachers who work collaboratively share information about how they use various instructional strategies to increase student achievement. The collaborative effort provides the PLC a chance to strengthen their teamwork as they work toward reaching the school's academic and cultural goals. An emphasis is placed on learning; however, powerful conversations can produce worthy dialogue as teachers focus on new concepts for school improvement.

Professional learning communities provide professional development opportunities through collaboration among teachers and interaction with school administrators. Professional learning communities support teachers in thinking about their practice and ways to improve it. Common planning time allows teachers to support each other in applying what they have learned through professional development training and PLCs, and to learn new skills from each other in the process of preparing lessons.

Common Planning Time

Teachers benefit from having a common time to work collaboratively on developing lessons for student learning. Teachers need time to work together to build a sense of belonging and to hold each other accountable in their day-to-day responsibilities. According to DuFour (2011), providing teachers the opportunity to plan together is important. Teachers who work together during their planning time take into account how their colleagues approach instructional strategies, procedures, and rules in the classroom, which can, in turn, help improve their teaching practice (Barney & Deutsch, 2017).

Common planning can be viewed as the central focus of teacher collaboration to improve learning.

A time period should be built in the master schedule, so teachers can meet the same time each day. Common planning time may be referred to as a particular time that is specific to the needs of a team of teachers to meet with each other a make plans according to the curriculum (Lomascolo & Angelle, 2017). The implementation of common planning can be accomplished by grade level or subject area. This type of planning would provide structure and an organized time for teachers to strategically improve their instructional practice. Common planning time also provides an opportunity during the school day for teachers to discuss grades, behaviors, projects, parent conferences, and means of communication to all stakeholders (Tamir et al., 2017). Tamir et al., (2017) noted that common planning times last a minimum of 30 minutes each to allow teachers to derive the greatest benefit.

Jones and Thessin (2017) mentioned that common planning time is helpful for novice teachers when they are paired with experienced classroom teachers. Common planning time benefits teachers by improving instructional strategies, encouraging information sharing, facilitating open dialogue, and providing opportunities to speak freely without being judged. Scruggs and Mastropieri (2017) indicated common planning also has an influence on instruction and acquiring new information. Common planning has benefited the culture and climate of the school, leading to positive attitudes among students, improved behavior, and an increase in test scores. In addition, common planning boosts teacher morale and job satisfaction (Pratt et al., 2017).

The purpose for common planning is to provide teachers with an opportunity to collaborate as a team, so they can work toward the same common goal. When a teacher has been designated as the lead teacher during common planning sessions there is a positive outcome that takes place during the meeting (Patterson et al., 2018). School instructional leaders hold responsibility for scheduling common planning sessions for teachers. Instructional leaders need to take into consideration the ability of the teachers and decide which person should be the lead teacher in the group. The lead teacher will be responsible for maintaining focus and ensuring planning is taking place instead of wasting time.

Common planning has a positive effect on how teachers view the direction of the school (Conderman & Hedin, 2017). Common planning helps teachers see there is structure, organization, and purpose in the school's efforts to achieve high standards. Teachers who buy in to the common planning process are better able to increase the academic performance of students (Sally & Bates, 2018). Common planning can also affect how parents see the school and how they believe their children will be treated there by creating a sense of unity in purpose.

Common planning time allows teachers share their knowledge to create quality lessons. As teachers implement the lessons they have planned, they can use formative and summative assessment to identify content for which students need additional instruction and content they have mastered.

Formative and Summative Assessment

Improving educational policies in school systems can be difficult. According to National Assessment of Educational Progress (2015), policymakers have a deep interest in the quality of instruction being provided in schools. Policymakers' interest has increased to a level at which they place emphasis on student assessment tests. The results of the test provide policymakers with information based on the quality of teachers and schools in a particular district.

The literature indicates formative assessment can increase student learning, improve test scores, and close the achievement gap among advanced- and low-performing students (Hattie, 2012). Teachers who practice using formative assessment have the opportunity to promote equity in the classroom. Formative assessment may be viewed as a tool teacher use to produce mathematical and literacy skills to develop students' thinking (Hakuta, 2013). Use of formative feedback to assess student learning encourages critical thinking that will help with problem-solving in math (Hakuta, 2013).

Formative assessment is a tool that will benefit teachers once they have been provided with the training on how to use it and can be used across the curriculum. Math teachers need to learn how to apply formative assessment to their specific content (Black & Williams, 2016). Often, assessment is associated with test and grades, which could result in more work for teachers and added pressure for students to perform. According to Black and Williams (2016), formative assessment provides information about student achievement throughout the educational process, allowing teachers to plan instruction that is responsive to students' needs.

Teachers can view formative assessment as a way to respond to student achievement outcomes and taking the next step to improve instruction. The teachers should collect as much data as possible to be efficient in the process of making decisions to meet the students learning needs. Teachers should also learn from student's misunderstanding. Formative assessment strategies should be one of the main focuses for improved instruction. Formative assessment can require students to speak freely about answer choices. To ensure students work collaboratively with formative assessment, teachers do not have to grade incorrect responses.

Summative assessment is a tool used to measure the achievement standards that were previously taught and are given a statistical value (Broadbent, Panadero, & Boud, 2018). Summative assessment also considers the competency level of the individual. According to Buchholtz et al., (2016), it is a standard practice used by teachers to assess knowledge and provided learning opportunities. The instance that students are asked to give feedback on lessons that were previously studied constitutes a situation that forces a summative assessment. Recalling information from past learning opportunities is significant to addressing summative assessment (Buchholtz et al., 2016).

Another form of summative assessment addresses oral responses at the end of a unit. This form of assessment can reflect in a presentation format that reveals the information that was learned during the semester. Teachers have the option to conduct a discussion about the learning to check for understanding of the lesson that was taught. This way teacher can track important information in a specified timeframe.

Helping teachers learn to use formative and summative assessments can aid in ensuring knowledge gaps are addressed. Ensuring that teachers understand the standards they are attempting to teach to, and assess student achievement of, is important as well.

Understanding Math Standards

The math curriculum changed when the Common Core State Standards (CCSS) were implemented to address the characteristics of instruction and standardize tests (Marrongelle, Sztajn, & Smith, 2013). The shift in the math curriculum allowed the teachers a chance to focus on what students needed to know and learn (Marrongelle, et al., 2013). This change came about to better prepare students for college and career. This effort was also to ensure that teachers developed their instructional practice, so student achievement increased. Student achievement in math forced the school's instructional leader to use professional development to improve standardized test scores. In addition, understanding math standards can contribute to teacher development and may lead to improvement on standardized test.

Teachers may have a full understanding of math standards when they are exposed to the process of unpacking standards. Unpacking standards is a process used to demonstrate what the teachers should be teaching, objective of the lesson, and plans for the lesson, vocabulary, and student outcomes. According to Juilen, Gross, and Latham (2018), unpacking standards helps teachers select standards that help students perform at a high level. The purpose for unpacking standards can also be linked to teachers understanding of how to use them. Achievement standards are essential to a level that all students learn math.

All students should be provided opportunities to participate in standards-based instruction. According to Kleinert (2014), there have been times that students were left out of standards-based learning and were not expected to know them. Standards-based learning remains an important aspect for teachers to understand because it focuses on the general standards that are part of the curriculum. Kleinert (2014) mentioned that teachers still need to receive a substantial amount of training to become experts with standards-based instruction.

The U.S. Department of Education (2015) made it clear that standards-based instruction is at the forefront for all students. To make certain that all students are held accountable for their learning the general curriculum has been reviewed so the high expectations are meaningful for the state standards. The U.S. Department of Education (2015) has invested a lot of money to support schools with instruction that is relevant to for all students. The common trend for all students has placed an emphasis on teachers to provide systemic instruction for the success of student achievement. The focus is on teaching students the standards of the math curriculum and how to gain an understanding of the material (Sevis, Cross, & Hudson, 2017).

Teachers can have a better understanding of the standards and have a knowledge base that will provide accommodation for students to achieve success with the curriculum (Sevis, Cross, & Hudson, 2017). Sevis, Cross, & Hudson, 2017 researched a way of helping students with learning and acquiring skills through a system that allowed them to demonstrate their level of cognitive skills and understanding of standards. This means that the curriculum should address a sequence of skills to show progress. The teachers

may also think about using instruction that supports standards-based learning that is specific to shaping the intellect of students.

Summary of Literature Review

The literature review discussed information about professional development, professional learning communities, assessment, and teachers' understanding of math standards. The information that was discussed explained how vocational teachers need to understand and have the skills for improving their instructional practice. The concept of improving instruction is relative to teachers being trained. According to Kong (2014), vocational math teachers who are trained will gain the necessary skills needed to teach students mathematical concepts to improve academic performance. Kong (2014) also mentioned that vocational teachers perform better when they are given immediate feedback from a lesson that they have taught.

The findings from the data analysis revealed that professional development is the tool needed to improve quality instruction among vocational math teachers. If teachers participate in professional trainings, they can acquire the math skills and strategies needed to provide their students with learning opportunities to support their learning. The findings in this study may influence vocational teachers to adopt the suggested recommendations provided in the policy paper. The policy paper may provide clarity and understanding of professional training, which is suggested to improve the instructional practice of vocational math teachers.

This project will be explained to all stakeholders. I created a policy paper to address the local problem and suggest a solution that may improve the quality of

instruction of vocational math teachers. Increasing the attention given to professional development will be a major positive step as it facilitates increased teachers' involvement in the process of improving student math achievement.

Project Description

  The project developed for this doctoral study is a policy paper aimed at helping education leaders at the district and school level recognize the need to provide ongoing professional development for vocational math teaches and suggesting policy that would provide a foundation for a sustainable solution to the problem. Providing the district policy suggestions will encourage a more sustainable approach to improving math instruction at the study site than providing one-time training, which might help in the short term, but is not an effective mechanism for continuing improvement or for addressing the needs of new vocational math teachers in subsequent school years. Findings indicated that vocational math teachers need a multifaceted professional development approach. The policy paper includes recommendations that call for requiring principals to provide instructional feedback, providing teachers with training opportunities, and creating professional learning communities among the vocational math teachers. The literature review examined peer-reviewed research on topics related to policy papers and professional development. The literature review and the findings informed the policy paper. The objective of the policy paper was to help ensure that the problem of vocationally trained math teachers at the local setting lacking sufficient math teaching skills to support adequate student achievement was addressed in a sustainable manner. Project implementation will include presenting information to stakeholders to

inform them of the research findings and encourage them to adopt the recommendations contained within the policy paper.

To gain the broadest possible support for the policy recommendations, stakeholders at all levels will receive invitations to the presentation. District leaders will be invited because they have the authority to implement the suggested policies at the district level, which would allow for social change regarding professional development for vocationally trained math teachers. Instructional leaders at the study site will receive invitations to the presentation because they have the authority to implement the policy recommendations at the school site, even if they are not adopted districtwide. Vocational math teachers will receive invitations to the presentation because they would be the direct beneficiaries of policy changes regarding their own professional development. Even if district and school leaders were unwilling to implement the recommended policies, teachers could choose to create a professional learning community on their own and work to implement the ideas contained within the policy recommendation to the best of their ability. During the presentation, stakeholders will learn about the research findings and how those findings informed the policy paper. They will each receive a copy of the policy paper and will have the opportunity to ask questions.

Resources and Existing Supports

The instructional leader will need to organize the meeting at which the project study and policy paper will be presented. The instructional leader will be held accountable for making contact with the faculty to ensure they are present during the

presentation. It is likely that the target school will have the proper equipment for this presentation.

As the researcher, I will make myself available to present findings and policy recommendations at the school. I will explain to all stakeholders the benefit of having a strong policy for ongoing professional development. Each person attending the meeting will have the opportunity to speak freely about the findings and policy paper and their potential effect on vocational math teachers.

The use of technology will be critical to support teachers with their instructional practice. Technology is an instrument that is used to enhance the skills of students (Spencer & Smullen, 2014). Teachers have been known to use technology to engage students with learning opportunities. The school has adequate technology for supporting vocational math teachers in improving their teaching skills and enhancing their lessons.

Potential Barriers

There are several challenges that may interfere with adoption of the recommended policies. There may be a lack of buy-in that could cause stakeholders at any level not to adopt the suggested recommendations in the policy paper. District leaders may not feel the potential return on investment is not worth the financial or human resources needed to implement the recommended policy. School leaders may feel that the extra time and attention required of them to implement policies are not within their means given the current demands on their time and energy. Teachers, though willing to identify problems, may not be willing to buy in to attending additional trainings and forming learning communities. One possible source of lack of buy-in could be veteran teachers not

wanting to make changes because they are so accustomed to their current instructional practice. According to Zimmerman (2010), teachers resist change because they do not believe in the recommendations or policies being presented. Teachers will need to understand the benefits of change to buy in to what is being presented. Continuing interaction between the school's leaders and teachers, focused on highlighting the need for change and redefining expectations, will be instrumental in getting teachers to gravitate toward new ideas and concepts.

A strategy that may be used to overcome this barrier at the targeted school involves using data to show a need to improve learning and providing a plan for how the data will be used to support learning. Teachers need to understand data before they are able to use it to fidelity. When instructional leaders allow the teachers to have a voice and the opportunity to provide strategies to improve the current situation, they provide powerful way to garner teacher buy-in.

Another potential barrier could be lack of planning. If the stakeholders are eager to implement the policy changes and do not take sufficient time to plan that implementation, the changes could fail. According to Walker (2014), lack of planning is the number one reason that projects are not successful. Improper planning could lead to poor execution and a low level of expectations. People fail to plan properly because they do not fully understand the importance of preparation (Walker, 2014). I work to ensure proper planning is done to avoid the pitfall of an ineffective presentation. District leaders, school leaders, and vocational math teachers will need to recognize that planning will be

one of the most time-consuming steps while working to implement the recommended policies.

Managing planning is essential. Poor planning can be avoided by scheduling a date and time to prepare for the presentation. During this time participants should be attentive to detail as it relates to the materials to be distributed, format of the presentation, purpose, evaluation, and outcome. The presenter has an obligation to address these concerns, so the presentation is effective and beneficial for its intended purpose.

Proposal for Implementation and Timetable

Planning. The first step will be planning a meeting at which to present the research findings and policy paper for this project study. This planning process will begin on approval of the project study and should take no more than 2 weeks. During the planning phase I will reserve a room for giving a presentation about the findings and policy paper at Gump Vocational School, prepare a list of stakeholders to invite to the presentation, and make phone calls to district leaders and speak in person to school leaders to briefly share my work with them and encourage their attendance at the presentation. Because low math performance reflects negatively on the district and impedes the district, ideally district leaders will embrace the policy recommendations and work to implement them. For the purpose of this paper, willingness of district leaders to support and champion the recommendations will be assumed, as will their willingness to promote and attend the presentation.

Preparation. After invitations have been distributed I will monitor responses to determine which stakeholders will attend the presentation. I will create a PowerPoint

slide deck to use as a visual aid during the presentation. I will make adequate copies of the policy paper to give each person who attends the presentation. Stakeholders who cannot attend will receive a copy of the policy paper and the PowerPoint presentation by email after the date of the presentation. On the day of the presentation, I will ensure that the room is set up to accommodate all attendees and that all technology is operating and ready for use.

Presentation. Within 6 weeks of approval of this project study, stakeholders at the district and school levels will attend a presentation to learn about the research findings and the related policy recommendations for improving instructional practice for vocational math teachers. This presentation will raise awareness of key stakeholders and set the stage for moving to the planning and implementation stages. Participants will have the opportunity to ask questions and make comments about the presentation.

Roles and Responsibility of Student and Others

As the researcher and project developer, my role is to ensure key stakeholders have the information they need to be fully aware of the local problem, informed about findings related to research on the problem, and familiar with the recommended policy to improve the problem. The responsibilities connected with this role include complementing this project study, presenting the findings of the study and related policy recommendations to stakeholders, and serving as a resource to stakeholders as they plan for and implement the recommended policies.

District leaders should be the driving force behind policy adoption because policies established at the district level have the greatest opportunity for full

implementation. The district will need to allocate appropriate funds to support providing professional development training both on and off site. Additionally, the district will need to allocate funds for substitute teachers when vocational math teachers are attending training during the work day.

The school's instructional leaders will need to be familiar with the findings of this study and support certain aspect of the overall professional development effort. In particular local school administrators will need to ensure that class schedules allow vocational math teachers to have a common planning time and facilitate creation of professional learning communities. They will also need to create time in their schedules to evaluate vocational math teachers' instruction and provide them feedback to help them improve their instruction as needed. The instructional leaders will need to make sure this strategy is used to improve the overall academic goals of the school.

The teachers' responsibility will be to participant in the professional development opportunities provided. They will attend professional development training sessions and then work to implement what they have learned in those sessions. They will participate in PLCs, providing feedback, suggestions, and support to each other. They will work together to ensure they are creating lessons that offer the greatest potential for addressing student learning needs by collaborating during a common planning time. Finally, they will adapt their practice as needed to incorporate new skills and to respond to peer and administrator feedback.

Project Evaluation Plan

The policy paper provides recommendations for how the district can support improving vocational math teachers' teaching skills. Three primary stakeholder groups could provide meaningful evaluation of the project: (a) school district leaders who hold jurisdiction over policy development, (b) school instructional leaders at Gump Vocational School, and (c) vocational math teachers at Gump Vocational School. Gathering evaluative feedback from all these stakeholder groups will provide insight into the quality of the recommendations and the likelihood that they will be adopted. Members of the stakeholder groups will complete a summative evaluation in which they will provide feedback about the presentation of the policy paper. Summative assessment may be viewed as an assessment that focuses on the results at the end of a program (Bennett, 2011).

After the policy paper presentation, participants will receive an evaluation form to assess the effectiveness of the presentation itself, the depth of information provided regarding the policy recommendations, and areas of improvement. The assessment will help with making any needed revisions to the policy recommendations. Any questions that the participants want to ask will be addressed at the end of the training. The participants will have the opportunity to share what they have learned with other staff members at their school.

Project Implications

This project will support social change by providing a framework for supporting vocational math teachers in improving their teaching practice by creating district policy

requiring ongoing and comprehensive professional development opportunities for vocational math teachers. Vocational math teachers will benefit from this policy paper because it will help create a system of sustainable professional development. When the recommendations in the policy paper are implemented, teachers will gain knowledge and skills for effective classroom instruction. As the literature suggests, when the professional development approaches outlined in the policy paper are enacted, student learning should be enhanced, providing additional opportunity for social change (Hill, 2015). Ultimately the knowledge that teachers will receive will affect how students view themselves in society. According to McMichael (2016), when situations such as that at Gump Vocational School are addressed, teachers can better help shape and mold students in productive citizens.

The recommendations included in the policy paper are researched-based. The implications for social change have been noted, and a strong case for using professional development to support teacher learning was established. As the recommendations in the policy paper are implemented, improvement in student achievement is anticipated to follow.

Conclusion

Section 3 included a discussion of literature related to policy papers in general and the topics related to the policy paper developed for this study in particular. The policy paper is based on findings from the research that vocational math teachers at the study sight need professional development to improve their teaching practices and consequently student learning and outcomes in math. The policy paper focused on

providing ongoing professional development training, establishing a professional learning community, providing teachers assessment of their teaching practice, and ensuring teachers understand math standards. The policy paper for this study will be shared with the instructional leaders at the school under study, participants, and local school officials. The research-based policies may help vocational math teachers at the study site and other vocational math teachers improve their teaching practice, and consequently student learning. Section 4 will reflect on the project for this study.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

The findings of this project study provided information that may be beneficial to vocational trained teachers in Gump Vocational School. The findings can also be helpful to administrators and district officials in other districts and states. The findings showed that professional development is necessary to improve the instructional strategies of vocationally trained teachers.

Project Strengths

One of the project's greatest strengths is that it makes the case for providing ongoing professional development for vocational math teachers and encourages the adoption of a district-level policy to ensure that such professional development is sustainable. The policy paper includes discussion of how professional development training is essential to the growth and development of vocational teachers. A conclusion of the study is that vocational math teachers need to have the opportunity to leverage professional development opportunities on an ongoing basis throughout the academic year, so they can work to improve their instructional strategies and methods on a consistent basis. Ongoing professional development may help to equip vocational math teachers with the necessary knowledge and skills needed to improve their instructional practice. The policy paper I developed has four other recommendations that are suitable for improving teacher practices: (a) creating a strategic plan, (b) developing a professional development training schedule, (c) implementing a PLC, and (d) helping teachers understand math standards.

Recommendation A. School leaders should devise a strategic plan to support struggling vocational teachers in enhancing their skills so that they become effective teachers. Professional development should be the driving force to help teachers improve their practice. A collective effort among the vocational math teachers can be important in monitoring progress among the teachers. The study site's instructional leader can evaluate the instruction given by the vocational math teachers frequently and provide immediate feedback. Frequent monitoring of teachers should ensure accountability to the feedback provided in the evaluations. The monitoring of the instructional process also lends support to teacher effectiveness. This recommendation may be most important to teacher success.

Recommendation B. District and school leaders should work together to develop and maintain an ongoing professional development session schedule so that teachers stay abreast of new practices and ideas for providing instruction. The professional development trainings that are scheduled should focus on strategies that will improve teachers' preparation, planning, lessons, and assessment practices. Teachers would attend professional development training sessions to enhance their knowledge, share information, and ask questions in support of their professional growth. Other stakeholders could also attend professional development training to gain a better understanding of the strategies that are necessary for teachers to improve and to help them better know what training should be included in the future.

Recommendation C. Implementing a PLC to discuss the school's vision, goals, and mission, aligned with professional development, should also help improve teaching

skills among vocational math teachers. A PLC may be referred to as a community of learners who promote educational experience to meet students' needs (Nichols, 2018). A PLC can be used to support struggling teachers and provide a sense of belonging to aid in the growth process for improving teacher practice (Vanblaere & Devas, 2018). Vocational math teachers at the study site expressed that they are eager to learn about math concepts and practices to help students improve their academic performance. I believe that a PLC is necessary to help stakeholders work together to accomplish the school's goals.

Recommendation D. Developing a specific plan to help vocational math teachers understand math standards would help enhance their instruction. The plan should be used to guide the planning and preparation for instruction in the classroom. Weekly meetings should provide opportunities to discuss standards that are relative to or aligned with the ACT WorkKeys. The weekly meetings can be held during the teachers' planning period. To ensure that teachers are meeting to discuss strategic ways to improve instruction and student test scores, a sign-in sheet will serve as documentation, and minutes will be kept, which will be turned in to the instructional leader. The purpose of the documentation is to hold everyone accountable and to demonstrate a high-level of operational procedure within the community of vocational math teachers. The instructional leader should be involved in the monitoring process to establish a sense of solidarity in working toward the goal of improving student math instruction.

Strength of the policy paper as a whole. Together, these practices when used as a tool may help advance teachers' progress in the classroom at Gump Vocational School.

The policy paper can serve as a guide during the decision-making process as it relates to the professional trainings in the school. I created the policy paper with the idea that it would impact change within the local school district.

Project Limitations

Despite its strengths, the project paper is limited in that identifying a need for comprehensive policy is only the first step in addressing the problem of inadequately prepared vocational math teachers at Gump Vocational School. District leaders may not be willing to adopt policy changes. The school instructional leader may not be willing to focus on improving teacher quality as outlined in the policy paper. Furthermore, the vocational math teachers may not be in favor of attending additional training or adopting practices such as common planning and PLCs because they are content with the way they are accustomed to doing things. Teachers may also resist change because they believe they are comfortable with their previous practice, raising concern about teacher buy-in. According to Egert, Fukkink, and Eckhardt (2018), teachers are more receptive to new ways of doing things when the transition is easy to understand. The lack of support of professional development may cause improvement strategies to be prolonged.

Limited resources could alter the timeline for implementation of ongoing professional development. To begin the professional development process, there should be money allocated to pay for absences when teachers attend professional trainings. This budget should also extend to the presenters of professional development sessions to ensure that they are compensated for their work. The potential of limited resources may alter the scheduling for professional development sessions at the school under study.

Some other limitations may include time and personnel to accomplish the outlined objective.

Poor planning on the behalf of the planning officials would cause the implementation of professional development sessions to be limited. The instructional leader may have a different idea about what would support the growth and development of vocational math teachers. Adequate preparation could also be problematic in adopting practices such as common planning and PLCs. These practices are collaborative in nature and, if not well planned, can become exercises in frustration rather than opportunities for professional growth (see Jackson & Markarin, 2018). According to Jackson and Markarin (2018), the challenge for executing a proper plan involves educators using the necessary resources needed to execute the plan. Thus, the role and responsibilities for all professional development required by new policy should be clearly defined and aligned according to each person's area of expertise. When administrators take on all the responsibility and do not delegate the multiple tasks necessary to address the planning process, they introduce further limitations. Furthermore, when teachers are excluded from the planning, they may not feel invested in the process.

To address potential limits of this project, district and school leaders will be instrumental in establishing a positive culture and climate for change at the school. To do so, they will need to commit for investing the time, human, and financial resources needed to implement the policy to fidelity. They will also need to develop a vision and mission for implementing the new policy and articulate them clearly and frequently to vocational math teachers.

Recommendations for Alternative Approaches

This study addressed the local problem of vocationally trained math teachers to support their growth and development to improve their instructional practice in the classroom. The project focused on the need to adopt policy to provide vocational math teachers with ongoing professional development opportunities to enhance their teaching practice. Although establishing relevant policy makes providing vocational math teachers opportunities for professional development a priority, there are other ways to support vocational teacher's learning. Research findings indicated that professional development opportunities such as professional development training, PLCs, and common planning are an ideal best approach for improving instructional practice of vocational math teachers at Gump Vocational School and worthy of being adopted as policy. Providing teacher mentoring and instructional math coaches might also help address the problem at Gump Vocational School.

Mentoring is a technique used to provide additional training to mentees in regards to the program's goals (Jones, Tones, & Foulkes, 2018). The identified group of teachers would need to be actively involved in this process to become effective with their practice. Teacher mentoring programs have been a staple to improve teacher effectiveness for many years. According to Jones, Tones, and Foulkes (2018), the approach to mentoring teachers should be based on what the mentor believes is effective and what has proven to be successful among new teachers. There is also a benefit for the mentor teacher who guides the process of enhancing instructional skills. A teacher mentoring program should emphasize teacher efficacy to promote the successful student learning.

A teacher mentoring program may benefit teachers in improving their instruction as they improve their professional capacity. The partnership is intended to address the cognitive skills of mentees, so they become better prepared to ask critical questions, provide meaningful feedback, and reassess the classroom environment. According to Gjedia and Gardinier (2018), mentoring teachers ensures that the mentee is exposed to all facets of the instructional process.

Mentorship could vocational teachers as they reflect on their own beliefs and attitude about the mentoring program. Teachers may have the opportunity to speak about student learning and the teaching profession. According to Gjedia and Gardinier (2018), mentoring allows mentees to discover their weakness and correct their own miscues. Reflective practice drives the mentoring partnership in a positive direction, which leads to positive results in terms of improved instruction and academic performance of students. A mentoring program was not included in the project portion of this project study because the research findings did not indicate vocational math teachers identified mentoring as a desired practice for improving their instruction.

Another alternative recommendation is to have an instructional math coach model lessons to struggling vocational math teachers. Common Core State Standards for mathematics place emphasis on testing the students' knowledge as it relates to reasoning (Polly, Mraz, & Alogozzine, 2013). New concepts in math are being used to build the foundation for early grades. Math coaches can help improve teacher knowledge and skills centered on developing competence to address student learning (Polly, Mraz, &

Alogozzine, 2013). An instructional math coach is an educator who works in a school to provide professional growth on-site (Knight, 2004).

Coaching provides opportunities to learn from the math professional. This approach is intended for targeted assistance over short periods. The role of the instructional math coach is to assist teachers with building a capacity of understanding about instructional practices. The coach must have the knowledge of understanding the standards and curriculum for math. It is also important the coach be an effective communicator, organized, and structured in the procedures to be used to move the teachers forward. Coaches can work with one teacher or a small group to support professional learning. The two entities working together form a relationship that consists of collaboration, respect, monitoring, and evaluation. The coaching process involves working toward a specific goal and having a plan to accomplish that goal. The coach's responsibility is to support teachers, so teachers can improve their instruction.

Coaches are on school sites to model lessons, work with teachers, and provide immediate feedback. This approach will ensure teachers and coach are in sync as they plan and prepare for teacher success. The instructional math coach should be experienced and be prepared to observe any classroom and model a lesson when necessary to improve the teacher's presentation. According to Shidler (2015), math coaches help teachers develop a deeper understanding about the math program.

The instructional math coach is a research-based way to assist with the professional development of teachers. Coaching cycles have been connected to increasing the instructional strategies of teachers along with higher test scores on student assessment

(Polly, Mraz, & Algozzine, 2013). The demand for students to reach a high level of proficiency has guided school officials to allocated funding for instructional coaches. The need to transform struggling vocational math teachers into quality instructors should remain at the forefront of having an instructional coach at the school. The partnership may also help shape the expectations of all stakeholders at the school under study. Math coaches were not identified by any of the study participants as a desired approach for helping them improve their math instruction.

Scholarship, Project Development and Evaluation, and Leadership and Change

In this subsection, I reflect on my development as a scholar, project developer and evaluator, and leader.

Scholarship

Scholarship may be known as a process for students learning at a higher level. The beginning of this program has prepared me to understand the concepts of research and the different methods to address the local problem. The program's design has also provided me with the skills necessary to view topics and understand them on a scholarly level. As a scholar practitioner, I am able to engage in a deeper understanding about issues and concerns that affect the field of education. The program has given me a broader set of skills for collecting and analyzing data and using it to help foster social change.

I learned how to conduct scholarly research during my doctoral journey. I was faced with the challenge to write in a scholarly manner at the beginning of my program. This was a difficult challenge for me due to lack of knowledge about a scholarly voice. I

was able to take a writing course and work with an editor to overcome this barrier. I completed the writing course and proceeded with my course work and major assessments. I learned that research material needed to be supported by peer-reviewed articles within the last 5 years. The support of the articles should also be research-based in the field of study. The scholarly tone of the paper should be based on the use of primary sources to develop the research material.

The scholarship in this program provided me with the opportunity to expand my skills as a novice researcher. I am now able to address a local problem in my field of study, determine a purpose, develop research questions to drive the study, collect data, and analyze the findings for presentation. I have learned how to use research to improve the current situation in a particular area of concern. It is important for school officials to buy in to the research so they will incorporate findings into the betterment of the school.

The development of the project posed a different type of challenge for me due to not having used an online program before in my educational career. This was my first experience using an online program to access information that was instrumental in my project development. I had to overcome the issue of not being able to interact with my instructor or other students in a traditional classroom setting. Once I became familiar with the online process, I was able to follow the outlined procedures of the rubric to guide the writing and development of my project study. In addition, Creswell (2012) was most helpful by clearly outlined the steps in designing qualitative research.

The qualitative research design allowed me to conduct research using interview sessions to collect data. I was able to develop a policy paper based the results of the

research finding in this study. The project suggests a policy for professional development be adopted as a tool needed to support vocationally trained math teachers to improve their instructional practice. With the project, there are recommendations included for the instructional leader to consider for implementation as it relates to teacher effectiveness.

The biggest challenge for me was to juggle time between my full-time job and being a doctoral student. I asked several fellow students, colleagues, family members, and friends for advice on how they would manage their time to develop a project to implement change within the targeted school setting. The best advice I received was from a fellow student who had a similar situation as mine relative to work, family, and school. She and I decided to track our time for one week to determine where we were spending most of our time and explore opportunities that presented time for working on the project. The information revealed that early mornings during the week and weekends was most appropriate for my situation. This process provided me a support person on whom I was able to rely and with whom I was able to communicate to help me for the project.

The scholarship, project development, and leadership for change has opened my mind to scholarly work and the importance of being a change agent. This quest has prepared me to delve deeper into the work of myself and others as it relates to building a capacity to impact social change in the community. The research skills I have gained have given me the tools needed to address topics of concern and lead professional meetings to support the change needed to make a difference. I have improved as a student and leader to serve comfortably with other stakeholders to accomplish any task that I may be faced with to meet the overall objective of the school. In addition, I will seek

opportunities to serve on official boards and committees to use my acquired research skills to benefit specific organizations to impact social change.

Project Development and Evaluation

It was my understanding that the creation of my project had to be aligned with my research question. I was not sure about the type of project I wanted to complete based on the local problem of vocationally trained math teachers who lacked instructional skills to adequately prepare their students. I talked with three of my classmates and referred to the rubric for guidance. I decided to develop a policy paper that provided recommendations that would help improve the instructional practice of vocational teachers at the targeted school. I read literature about policy papers to have a full understanding about their purpose and how they would be best used for my research. A policy paper is an abbreviated document that is shared within an organization to address an issue (Zohar & Cohen, 2016). The policy paper associated with this project study was organized so it is an easy read for the intended audience. The paper suggests that professional development be implemented for the progress of vocational math teachers.

The initial stage of my policy paper began with the audience that would be reading the information and who would be impacted from the findings. The audience that is most appropriate to receive this information are educators who are working to achieve the school's overall goal based on the vision and mission statements. The information is also vital to the academic performance of students and the data revealed for the district's Report Card. The policy paper was arranged for readers to gain a better understanding of the recommended strategies to improve the instruction of the vocational math teachers.

The next phase of the policy paper addressed my thought process while inviting feedback from all stakeholders to meet teachers' need. The policy paper will be distributed to all stakeholders with the understanding that professional development will be the tool used to enhance the knowledge and skills of vocational math teachers. The impact of the recommendations should be monitored, so the instructional leaders are able to evaluate the effectiveness of the recommendations chosen for implementation. My role in developing this policy paper has ensured me that others school officials in the local school district may actually consider one of the recommendations for implementation. This would be most gratifying coming from the research that I conducted.

Leadership and Change

The leadership quality of this doctoral program has prepared me to be more assertive and engaged in meaningful change to better a learning institution. The doctoral program has helped me gain research skills that are helpful as I work collaboratively in my current position and lead other efforts that may involve change. I have a better understanding as a scholar practitioner of how to use research as a tool to support and cite evidence from previous studies to answer important questions.

The leader in me relies on valid and credible information to implement specific strategies for change. I have learned that researched-based evidence from primary sources is important to help close the achievement gap. I further understand that research conducted within the last 5 years is up-to-date and reflects findings that are most current. This piece of information gave me the opportunity to examine multiple studies and decide which journal articles best addressed the research question for this study.

Understanding the importance of finding current literature helped me decipher what literature was valuable to this study to improve the development of vocational math teachers.

The leader in me worked to affect change by approaching all stakeholders and encouraging them to participate in the process of developing teachers. I realized that an important part of being a change agent is encouraging stakeholders to implement professional development as a tool to strengthen instruction. I can visualize instructional leaders using this practice to become more effective. The leader in me allowed me to share data and demonstrate the capacity to make meaningful change that would impact the overall academic goal of the school.

This doctoral journey has given me valuable insight on how to address problems and issues associated with this profession. I discovered that vocationally trained teachers struggling with instructional strategies need to improve test results on the ACT WorkKeys. It was a goal for me to find ways to assist teachers to become better instructors. I was able to investigate this issue by asking vocational teachers what they believe would be the best practices to improve their instruction. I made the decision to research what vocationally trained math teachers needed to make progress with their knowledge and skills for teacher effectiveness.

This program allowed me the opportunity to improve my communication skills. I became more conscious of my thought process and word choices. I maintained my focus on the topic of discussion and did not drift to another topic that did not pertain to the current situation. The feedback given to others remained clear with logical reasoning to

support the feedback. I consider this a meaningful asset for those who take part in a leadership role. Evidence-based material and effective communication are key components for a change agent.

I have learned that leaders must possess confidence in their ability to encourage other to follow. The leadership trait that this program has helped me gain is the confidence needed to stand by reliable research and project development. A leader who demonstrates confidence may have the ability to gain the trust of others who desire to improve. This trait in leadership may be required to help colleagues that are struggling with the delivery of lesson or presentation for its intended audience. I think it is satisfactory for leaders to work with others and commit to their craft to become self-assured.

The commitment to make change may be critical to the success of the school. As a change agent in a leadership position, I believe it is important to model the behavior of leading by example. This type of leadership and commitment needs to be consistent, so others are able to buy in to change when changes need to be made. In addition, I believe the value of commitment to leadership is vital to creating a work environment that is industrious.

Self as Scholar

The beginning of my quest as a scholar-practitioner was a challenge due to the overwhelming factors of learning American Psychological Association style, writing a problem statement, developing research questions, reviewing the literature, learning scholarly writing, and aligning the methodology for my study. Continuously reading

Creswell (2012) provided me with the most understanding of how to approach my research design as a scholar-practitioner. The reading of literature helped guide my thoughts and helped me determine what type of research method was most appropriated for my study. I learned during the research process that information presented in the proposal must be based on factual evidence from peer-reviewed articles with the last 5 years.

I learned about various types of methodologies during the residency in Atlanta, GA. I attended multiple sessions that discussed research designs that included information about qualitative, quantitative, and mixed methods design. I was most comfortable with qualitative research design because I believed my writing skills were stronger than my ability to work with statistical data. I focused on completing a narrative for my findings using a qualitative approach.

The case study design using a qualitative approach allowed me the opportunity to interview participants and learn what they believe is the best possible approach to improve the instructional practice of vocationally trained math teachers. According to Morel and Coburn (2018), professional development has improved the practice of novice teachers during their time in the classroom. The findings from this study revealed that teachers believe they will grow with confidence and improve their delivery of instruction when ongoing professional training is included in their development. I was able to use this valuable information to create a project that will convey to local school officials the need to create a policy that supports providing ongoing professional development opportunities for vocational math teachers and to provide formal training as well as

school-based learning opportunities such as common planning and a PLC so teachers can improve their math instruction and students can improve their performance on the ACT WorkKeys.

Self as Practitioner

My interest in the field of education began 24 years ago. My desire to become a practitioner started at the early age of 12. I always found myself playing the role of teacher with my siblings. I have followed the pathway of my mother who was an educator for 30 years. The thought of earning an advance degree was never at the forefront of my dreams. This doctoral journey has been the highlight of my career as I worked as a practitioner.

As a practitioner, I was able to understand what constitutes research by asking questions to position myself in the research. There were a number of possibilities that exist as a practitioner. By conducting research, I was able to reflect on my own practice in the context of the study and consider ways I can improve my teaching. Practitioner work may be viewed as having a central focus on professional growth and transformation of self. Research can be a starting point for change in practice. Researching one's own practice does not necessarily lead to empowerment. The scope of empowerment arises from the challenge of overcoming challenges to find success (Cartaxo, Pinto, & Soares, 2018).

As a practitioner, conducting research empowered me to examine the local problem in this study. Working as a practitioner also gave me an opportunity to

understand action research. Action research provides the practitioner with a critical edge, which can take the findings of research to another level (Cartax, Pinto, & Soares, 2018).

I learned a sense of responsibility to think about why research is important, how to conduct research, why data are relevant, and how finding should be presented. The interpretation of the findings also adds to my responsibility to explore future implications about the research. The findings from the research need to be clearly communicated, so the contribution of the research is beneficial to the intended audience. The presentation and use of the findings will depend on the instructional leader believing that the research is helpful to the local problem.

The journey has been a worthwhile process. The coursework prepared me as a practitioner that led to the research portion of this program. My interaction with my chair and classmates also gave me valuable insight on how to read and interpret scholarly material as I grew as a practitioner. The skills I acquired as a practitioner include critical thinking, data analysis, and the ability to identify recurring themes or patterns. My experience as a practitioner has prepared me to apply research-based strategies in my daily work.

Self as Project Developer

The purpose of this project was to gain insight on how to improve the instructional practice of vocationally trained math teachers at Gump Vocational School. I was most interested to ask question of the teachers who are struggling with mathematical concepts and procedures to become effective teachers. Once I realized that the teachers would contribute as primary sources, I began to shape my interview questions based on

the local problem and conceptual framework to investigate information about this topic. The data that were collected revealed that professional development would be the best approach to addressing the needs of teachers, and the district needed a policy to ensure vocational math teachers would receive the training they need.

Professional develop can be offered to the teachers at various times throughout the academic school term. The presentation of information can range from understanding math standards, preparation, planning lessons, questioning techniques, and assessments practices. It would also be instrumental that teaches understand how to use data to drive instruction. The professional development session can be scheduled to take place during summer break, planning time, or after school to provide the greatest flexibility.

The development to my project gave me a different outlook on presenting information. I decided to develop a policy paper so it can be shared with other local school officials in the district with the idea of enlightening them regarding current research and helping them to establish as sustainable approach to supporting vocational math teachers in improving their practice. I learned that a policy paper offers recommendations to address problems that may exist within an organization.

The experience I had with the development of the policy paper was informative. I had to research information about a policy paper. Before starting this project, I was unfamiliar with policy papers and what they entail. As I developed the project, I would reflect on the purpose of a policy paper to help guide my thinking. I was able to summarize information about this research and offer recommendations for all stakeholders to consider. I will consider other options for implementation based on the

feedback I receive from my initial paper. The feedback from stakeholders will be helpful with improving future projects which will allow me to continue to grow as a scholar and practitioner.

Reflection on Importance of the Work

The overall importance to this research was to create social change within the local school that is experiencing a problem with achieving adequate proficiency in math on the ACT WorkKeys. The problem with poor student performance is due to the lack of training for vocational math teachers at Gump Vocational School. Implementation of continuous professional development can provide learning opportunities for teachers to enhance their knowledge and skills of mathematical concepts. Professional development will help foster teacher learning that is directly linked to students' academic performance. The objective of the process would be to educate teaches so they can be more effective in educating students in math. The combination of these skills may translate to teachers and students being more productive, which creates the potential for social change.

These efforts may lead to a better school and environment for others to learn. Teachers who commit to learning new ideas and new strategies take a quantum leap toward the betterment of others (Smylie & Eckert, 2018). In turn, the social change that comes from this project study has potential to improve the local workforce because students are better prepared for adult work (Rast, Hogg, & Randsley, 2018). as the school district realizes the benefits of expanding teaching skills and knowledge through a policy of continuing professional development, school officials and the community may be more willing to increase the investment in teachers.

I learned that teachers want to strive for improvement with the assistance of professional trainings. Teachers who may lack the savvy but have the potential will take chances to prove themselves as worthy of their position. I also learned that listening to teachers will provide the in-depth information needed to address problems and find possible solutions that will foster change. The information that is obtained from the teachers must be used in the decision-making. I believe the implementation of new ideas is better received by teachers when they know they have a voice in the process.

I also learned how to develop a project for this study. The project study allowed me the chance to gain a better understanding about professional development and the use of policy papers to encourage changes in policy. I learned that teacher's development is much like student development. Teachers need to be involved and engaged in learning opportunities to improve their craft so they are effective with their instructional practice. The more professional learning opportunities that teachers are engaged in increases their capacity to convey valuable information. I also learned that the professional trainings must be strategically organized to have an emphasis on active participation geared to enhance knowledge and skills of teachers.

My doctoral journey has been rewarding in the sense of critical thinking, conducting research, and presenting information to address a specific problem. I have learned how to critique the work of others and compare research that is relevant to the topic being researched. This experience has been most valuable to my personal and professional growth as an educator.

Implications, Applications, and Directions for Future Research

The potential impact of social change for this project study will be to improve the overall quality of vocational math teachers in the vocational schools in the local school district. The organization may benefit from the findings revealed in this study as it relates to improving teacher quality through professional development. Teacher quality may be viewed as having the applicable skills necessary to ensure learning takes place in the classroom (Goldhaber, Quince, & Theobald, 2018). Proving teacher's professional activities may increase their ability to teach with a purpose. I would suggest that struggling teachers be assigned a mentor to support them in addition to the support outlined in this project study.

I suggest that a veteran teacher who has demonstrated success in the classroom be paired with a teacher who is struggling. Struggling teachers be observed and provided immediate feedback to identify the specific problems that are present with instruction. Then the teachers should receive information about areas of concern regarding their instruction and work collaboratively with the mentor to address the issues of concern. Finally, struggling teachers should participate in developing an action plan and follow-up monitoring to help expand their instructional capacity. Coupled with the professional development outlined in the policy paper, these teachers would have a wealth of opportunities to improve their ability to teach math.

Vocational math teachers who are struggling need additional learning support to demonstrate progress. As they work to build a professional learning community and establish a kinship that supports one another and best practices for improving instruction

may develop. Teachers and school leaders can work to ensure these best practices are implemented by all the vocational math teachers. Additionally, these practices may be adapted and applied in other subject areas to enhance the instruction provided by all teachers in Gump Vocational School.

In additional to a professional learning community associated with professional development trainings, teachers can implement a make-and-take lesson to share with others. This is a method used to show other teachers within the content area how a lesson was prepared and developed for instruction. The purpose of this exercise is to ensure accountability and increase involvement among the struggling teachers who need learning support. Future research and emphasis placed on social change may present more strategies and information that lead to self-advancement in the field of education.

Conclusion

This project study focused on the local problem of vocationally trained math teachers not having adequate training to teach math. The purpose of the research was to find suggestions that would help improve the instruction by vocational math teachers. A qualitative research approach was taken to address the local problem. The findings revealed that professional development was needed to help build the capacity for vocational math teaches, and that the district needed a policy to ensure vocational math teachers receive ongoing development opportunities. The findings were presented in a narrative form to be shared with all stakeholders.

I was able to provide information about this study that began with the strengths about this project, scholar, project developer, implications of the project, and implication

for change. As I reflected on the overall scope of this project, I realized that conducting research gave me an experience that can make a difference in society. My contribution to making change and impacting society has made my struggle with time management worthwhile. I am now able to pass valuable information on to other stakeholders that has the potential to be implemented and impact teachers and students in this district.

I would like to suggest that instructional leaders and local school officials strongly consider the recommendations suggested in the policy paper. The findings in this study may benefit the struggling vocational math teachers. The information may be shared during planning times, faculty meeting, websites, conferences, and workshops. Vocational math teachers may also want to consider expanding their time in higher education for learning and development. This would give them a wider spectrum of instructional practices that may be considered for implementation.

My doctoral journey has been eye-opening as well as educational. Having the ability to delve deeper into a problem, collect data, and understand the findings has improved my skills as graduate student. I will continue to read literature that presents information on effective leadership and change. I will also continue to embark on research opportunities that pertain to my field of interest, so I can continue to create social change in my field.

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Appendix A: The Project

Professional Development: A Tool Used to Improve Vocational Teacher's Instructional Practice

Walden University
A Policy Paper
By
Nisha Woody

Introduction

The purpose of this study was to identify vocationally trained teachers'

perceptions about the best approach to improve the instructional practice of vocational

math teachers at Gump Vocational School. The policy recommendations were developed

from the findings of the research. The policy recommendations addressed the lack of

training for math teachers in this vocational school. Those recommendations include the

following:

- Meeting with teachers to discuss their specific needs regarding professional development.

- Providing professional development training to improve math teaching practice.

- Coordinating teacher schedules to facilitate a common planning time.

- Ensuring that vocational math teachers understand the math standards they are expected to address in instruction.

A vocational teacher is a teacher who teaches in a vocational field (Arifin &

Rasid, 2017). Those fields may include nursing, law enforcement, electrical, carpentry,

automotive, and computer repair is offered by most school programs (Arifin & Rasid,

2017). The policy recommendations will address the plan of action that may be taken to

initiate professional development at the school level to improve the instructional practice

of vocational math teachers.

There was careful consideration for each recommendation to provide an

understanding of the each policy recommendation to be adopted. The opportunity for

implementation was also given detailed attention to process the policy options. The

findings were instrumental in in the action to be taken, so all stakeholders are given the chance to review the data for implementation. The stakeholders have the option to accept or not accept the suggested recommendations.

This policy paper delivers information for the local school district officials to account for policy recommendations to improve the instructional practice of vocational math teachers. The suggested policy recommendations focus on the local problem of lack of training opportunities for vocational math teachers in the targeted school. The training opportunities will be beneficial to vocational teachers who lack adequate training for strategic teaching of math strategies (Golombek & Johnson, 2017). The findings from this research disclosed professional development as the tool needed to support the instructional practice of vocationally trained teachers.

Vocational teachers may have another problem when they face the challenge of increasing student achievement on the ACT WorkKeys. The barriers vocational math teachers encounter at Gump Vocational School include low test scores on standardized tests, limited resources, minimal training, and a decline in teacher staffing. These issues also have a direct effect on school culture and climate, employment opportunities for students, and the graduation rate. The multiple issues may be connected to vocationally trained teachers contributing to underachieving students in the school under study.

Methodology

A qualitative research design was used to collect data for this study. The data were analyzed to look for recurring themes or patterns from the information. A case study approach was used to gain a deeper understanding about the vocational teachers at the

Gump Vocational School. According to Creswell (2012), a case study reveals in-depth information about a specific event or individuals during a certain time span. The purpose of this study was to address the local problem of vocationally trained teachers who lack specific skills to be effective with their instructional practice. This research examined vocational teachers to determine the best approach to improve instruction.

A case study was most suitable to gain information about vocational teachers at the targeted school. The knowledge of the participants was an important factor to assist with the instructional practice recommended to enhance the skills of vocational math teachers. The pool of participants were purposely chosen, so I could gain a deeper understanding (Creswell, 2012). My role as the researcher for this study was to decide on the type of sampling, hold interview sessions, collect data, and analyze. The findings were arranged and prepared for presentation. The findings were summarized to show the how essential the data is to the local problem. The findings from this study also revealed professional development as the source needed to improve vocational teacher strategies.

A policy paper was developed to suggest recommendation about the local problem of lack of training for vocational math teachers. The recommended policy suggest that professional development be implemented by local school officials. The concern that exist with the current system is the lack of training opportunities for vocational math teachers and understanding test scores from the standardized test.

The proposal is to implement professional development to vocational math teachers in a systematic way so there is continuous opportunities for professional growth

and development. The scheduled training will include local school officials, so there is a buy-in to improve teacher's worth and student achievement.

Policy Recommendations

Recommendation A

The instructional leader at should focus on vocational math teachers who are struggling with planning, preparation, instruction, classroom management, organization, or structure. There will be a conversation with the school's leadership team to address the areas of focus for each teacher who lacks in these areas. The identified teachers' formal observation will be the instrument used to determine the level of efficiency in the classroom. The teachers will have the opportunity to voice their immediate need for professional growth.

Recommendation B

The instructional leader should plan for professional development sessions to ensure teachers receive the necessary skills needed to improve their instructional practice. The first session should be based on understanding math standards and how to develop them into lesson. The second phase of the professional development session should focus on how to implement the lesson into the classroom, so students are successful in math. The third step in the professional learning session should include opportunities for teachers to engage in a model lesson so teachers are familiar with the math activity. The final step in the profession learning should address the effectiveness of the training to address immediate feedback so the presenters are better prepared for upcoming sessions.

Recommendation C

The instructional leader should plan for the implementation process of the professional development strategy to meet the need of vocationally trained math teachers. There should be a time to form a common planning team so teachers can share ideas, examine data, and discuss how lessons will be planned to achieve better results of student outcomes. The instructional leader should designate at least 2 days a week for common planning to ensure teachers are working collaboratively to meet the level of proficiency in math on the ACT WorkKeys. The common planning time should be non-negotiable so there is accountability of this professional learning.

Recommendation D

The instructional leaders should develop a specific plan to help vocational math teachers understand math standards would help enhance their instruction. The plan should be used to guide the planning and preparation for instruction in the classroom. Weekly meetings should provide opportunities to discuss standards that are relative to or aligned with the ACT WorkKeys. The weekly meetings can be held during the teachers' planning period. To ensure that teachers are meeting to discuss strategic ways to improve instruction and student test scores, a sign-in sheet will serve as documentation and minutes will be kept to turn in to the instructional leader. The purpose of the documentation is to hold everyone accountable and demonstrate a high-level of operation procedure within the community of vocational math teachers. The instructional leader should be involved in the monitoring process to establish a sense of solidarity in working toward the goal of improving student math instruction.

Professional Development

Vocational math teachers who are lack the skills to be effective in the classroom need guidance with enhancing their skills. Professional development has been suggested as a key component to help vocationally trained math teachers improve their instructional practice. According to Egert, Fukkink, and Eckhardt (2018), professional development is a strategy used to support teacher growth and development. Professional development can also be used as a model to demonstrate a hands-on approach to successful instruction. This is a research-based technique that should be a part of teacher training. This instructional model has been connected to building teacher's cognitive and interpersonal skills (Egert, Fukkink, & Eckhardt, 2018). Professional development is beneficial to teacher progress.

Model lessons provide teachers with the chance to have firsthand experience with how to plan for lessons. The demonstration process creates a unique situation to teachers to present their planned lesson among other teachers. Long, Cummins, and Waugh (2017) mentioned that students will perform better academically when teachers are prepared and know the information that is being presented. Teachers are also given the chance to work together so their self-confidence is immersed in the lesson being taught. Model lessons may also be effective with teachers working to improve student achievement.

Cognitive development addresses the intellectual capacity in adults, so they obtain the skills needed to function in the classroom (Mangin, Harwood, & Woodward, 2017). Teachers need to focus on processing information on a daily basis because teachable moments may arise. The students pay an important part of learning, so teachers need to be prepared to relate to activities as they are developed. Cognitive development that

involves conscious intellectual activity serves as means to the professional learning

process in teachers (Rowe, Leach, & Cabrera, 2017).

Research has showed that teachers benefit form professional development when

they are active participants. According to Epstein and Willhite (2017), professional

development provides a systematic approach to embedding specific knowledge and skills

needed to become efficient with instructional practices. The teachers should use research-

based methods to meet the student's learning ability. The teacher's planning should be

based on the individual learning styles of students. This strategy is done to ensure that all

students are presented with differentiated instruction and increase student engagement.

According to Park and Datnow (2017), address multiple learning styles using

differentiated instruction will support the student's academic performance.

Implementation of Professional Development

The implementation of professional development has to gain the support of all

stakeholders. According to Vangrieken, Meredith, Packer, and Kyndt (2017), those

educators must use student data to prompt instruction from the results of student outcome

on achievement test. The test scores from achievement test should also be the focus for

planning lessons and activities. The usage of professional development trainings has been

considered the glue to teacher success (Arifin & Rasid, 2017).

The first step in the implementation process of professional development is to

schedule a work session to include. The work session will be designed to build the

knowledge and skills needed to perform effective in the classroom. Teachers will be

given the opportunity to participate in various activities on how to use the skills they

were introduced to during the professional development training. Teachers will also work collaboratively to improve their skill building and share information that leads to effective lesson planning, addressing standards, and addressing assessment practices that is the best approach to measure student outcomes.

The exposure to professional development is critical to the growth and development of vocational math teachers at Gump Vocational School. The vocationally trained teachers comprehend that professional development is the vehicle needed to support their progress as a teacher. The suggested training session for vocational math teachers will focus on common planning, understanding math standards, assessment practices, and building a professional learning community. According to Epstein and Whillhite (2017), professional development sessions must associate skill related activities that involves educators in the process of enhancing their intellectual capacity to engage learners in lesson. This will give teachers the chance to engage in dialogue with students, so they can gain a better understanding about the student's academic ability. This concept will also provide an understanding of how students think critically. The teachers should work as a math team to develop group norms and ensure the established practices are used systematically and appropriately to address the learner's need.

Instructional strategies are important to implementing professional development. According to Vangrieken, Meredith, Packer, and Kyndt (2017), teaching strategies equips teachers with strategic practices that allows them to have a complete package for classroom pedagogy. Teacher who understand how to identify the learning deficits of students make better use of their teaching strategies. Teachers can rely on student profile

data to drive their instruction. The student profile data indicates the level of proficiency of how the students performed on the standardized test in math. The interpretation of this data supports the teacher when planning for instructional strategies.

The participation of the teachers in professional development provide valuable information for success with instruction. Egert, Fukkink and Eckhardt (2018) mentioned teachers are able to find solutions to their own errors when they are active participants during professional training. The teachers should collaborate with other teachers to gain insight of mastery skills to strengthen their scope in mathematics. This is a step necessary for teachers, so they understand that peer interaction is essential to effective planning and instruction. The teacher engagement in professional development gives the skills and knowledge need for intellectual growth and earn professional credentials (Golombek & Johnson, 2017).

Collaborative Learning

Collaboration may happen at various times during the school term to help build the instructional sills of vocational math teachers. According to Retbiwati, Ayres, and Sweller (2017), collaborative learning is a process used to engage teaches in dialogue about a specific topic, so there is a clear understanding and effective use of a teaching strategy to be implemented with instruction. At the end of a collaborative session, teachers may be given the task to use an instructional strategy that was discussed during the session. This will ensure accountability among the teachers and instructional leader as a means for guided support for professional learning and implementation of professional development. Retbiwati, Ayres, and Sweller (2017) noted that collaboration has been an

important factor for school's achieving their academic goal. This collaborative effort also allows teachers to work as a team to share information about math standards.

Conclusion

The lack of professional development training for vocationally trained math teachers at Gump Vocational School was the focus of this study. The goal was to produce a policy paper to suggest recommendations to improve the overall instructional practice of vocational math teachers at the target school. The implementation of professional development trainings will be supportive to teachers needs for their identified weaknesses. The data derived for this research revealed professional development, PLCs, assessment practices, and understanding math standards as immediate needs that would be beneficial to teacher growth.

Professional development should be taken into consideration by the school's instructional leaders. These individuals are responsible for the day-to-day operation of the school, teacher development, and student achievement. The vocational math teachers will gain essential skills from professional development, so each improves in the areas of instruction and mathematical concepts. The instructional leader will also have opportunities to schedule workshops, conferences, and planning sessions to accommodate the adult learning.

The professional development training sessions should be ongoing. This is to ensure that the vocationally trained teachers receive consistent exposure to math concepts, activities, and skill builders during the year. The consistent practice should increase the teachers' level of comprehension with math standards and effective

approaches for teaching math. Their involvement creates multiple opportunities to practice, implement strategies, and ask questions about the anticipated outcomes. In addition, teachers will need to attend regularly scheduled professional development training sessions so they are instrumental in their own self-worth.

Reflection

The vocational math teachers at the school under study suggested that professional development is needed to improve their practice in the classroom. The teachers' experience was noted and suggestions were taken into consider to create this policy paper. A qualitative case study design was conducted to examine the local problem of lack of training for vocationally trained math teachers. The teachers took the time to provided information through interview sessions that was organized and analyzed to present the findings from the research.

The importance of professional development must be understood by all stakeholders. The school's instructional leader must buy-in in first before the teachers and others accept the implementation of professional development. The must also be a commitment to professional development as the number one tool need to improve teacher's instructional strategies and the academic performance of students. The attention to professional development may be used to plan, create lessons, address standards, and build continuity among the math teachers.

Future research on this problem should address how teachers improve using professional development strategies. Future research should also address the effect of professional development and how it affected student performance. The professional

development sessions must be designed to have teacher interaction and hands-on activities, so the intended practice is effective and beneficial to struggling vocationally trained teachers.

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Appendix B: Letter of Cooperation

Dear Nisha Woody,

Based on my review of your research proposal, I give permission for you to conduct the study entitled *Teacher Perceptions of Math Professional Development in a Small Vocational School*. As part of this study, I authorize you to use recruitment of potential participants, data collection, member checks, and results dissemination to community partners. Individuals' participation will be voluntary and at their own discretion.

I understand that we reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policy.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of Mrs. Woody without permission from the Walden University IRB.

Sincerely,
[Name Redacted]

Superintendent

Appendix C: Interview Questions

Date _____Beginning Time _____ Ending Time _____

Announce:

This interview session will be recorded for accuracy. If you choose not to be recorded, please inform me before the session begins. It is also your decision to discontinue the interview session at any time.

1. What position do you serve at this school?
2. How many years have you worked as an educator?
3. What is your highest level of education?
4. Have you always worked in a vocational school?

Interview Questions

Question 1: What do you suggest as the best approach to improve instructional strategies

of teachers in math?

Tell me more about the strategies you use to meet the individual needs of students.

Question 2: What do you suggest as the best approach to unpacking instructional

standards to teach math?

Please tell me more about this approach to improve understanding math standards.

Question 3: In your opinion, what are the instructional approaches that teachers might

use to improve planning for math?

Describe or explain your process for developing lesson in math.

Question 4: In your opinion, what are the instructional approaches that teachers might

use to improve activities related to math?

Tell me more.

Question 5: What explanations might teachers offer to account for their lack of training to teach math?

Tell me how teachers evaluate or monitor the level adequate training.

Question 6: In your opinion, what practice can the school adopt that teachers might use to improve planning sessions for math teachers?

Describe to me how you believe teachers build peer relationships.

Question 7: In your opinion, what strategies can be best used to prepare students for standardized test in math?

Tell me more.

Question 8: In your opinion, what type of assessment is best to determine academic success for students in math?

Explain the process to me.

Question 9: What do you perceive to be the best approach to train vocational math teachers to improve their skills?

Tell me more.

Question 10: In your opinion, what professional development will be most beneficial to improve

the overall quality of instruction for effective instruction in the classroom?

Tell me more.