

DO PROFESSIONAL SKILLS TRANSFER TO EDUCATOR PREPAREDNESS?
A CASE STUDY OF MASTER OF ARTS IN TEACHING AND TRADITIONAL
EDUCATION MAJORS AT THE UNIVERSITY OF CENTRAL MISSOURI

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by
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Presented by Timothy Wieland

a candidate for the degree of Doctor of education,
and hereby certify that, in their opinion, it is worthy of acceptance.

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DEDICATION

This dissertation is dedicated to my wife and family. To my wife Christina, thank you for keeping things together while I spent countless evenings in school or away for summer classes. It was not easy when we had farm animals and two young boys, but you never complained and always put everyone else's needs first. I could never imagine life without you and feel like the luckiest guy who ever lived because you chose to put up with me all these years. Not to mention, I could never have put this together without your hard work editing, formatting, and proofing everything multiple times.

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Do professional skills transfer to educator preparedness?

A case study of master of arts in teaching and traditional education majors at the

University of Central Missouri

Timothy Wieland

Dr. Sandy Hutchinson, Dissertation Supervisor

ABSTRACT

Alternative programs have multiplied to address the shortage of educators in STEM related fields. Results of programs have been mixed with teachers reporting similar difficulties regardless of the type of teacher preparation program. This study examines the traditional teacher preparation program and the MAT program at the University of Central Missouri. It focuses on the transferability of skills from teacher preparation and experiences outside of the teacher preparation programs. The results showed that applied skills practiced during teacher preparation were most transferable to the classroom. It also showed that any job-related experience transferred to the classroom whether it was content related or not. Personal experiences and maturity also increased teacher preparedness. Teacher preparation programs should include more focused and applied learning specific to teaching methods and in the classroom experience. Furthermore, extracurricular experiences should be promoted as a valuable component to develop intangible skills.

SECTION I: INTRODUCTION TO THE DISSERTATION IN PRACTICE

Introduction to the Background of the Study

Today's jobs are becoming more and more technical, and United States (US) workers are getting further and further behind. Today in the US, many jobs in STEM-related fields are being outsourced to other countries or workers are being imported to meet the demand of industry (Hira, 2018). In either case, American workers and industry are losing ground in the competitive worldwide marketplace.

To stop the backward slide in the US economy, lawmakers have proposed many business tactics to make US goods more marketable. These business and trade strategies are short-term solutions to the problem. Olson and Riordan (2012) report that the US will need to graduate one million additional Science, Technology, Engineering, and Math (STEM) majors to maintain current levels STEM professionals. Therefore, the US must increase the number of highly trained workers being produced through all forms of training and educational programs.

Fortunately, lawmakers and industry have created several initiatives focused on increasing the number of skilled workers. Nationally, there has been a push to increase emphasis on STEM career areas and training. According to Stevenson (2014), there have been three major business and non-profit organizations created solely to address the shortage concerns. In accordance with the America COMPETES Reauthorization Act of 2010, a Committee on STEM Education was established to review STEM education with a focus on increasing opportunities to meet the need for more STEM trained professionals (President's Council of Advisors on Science & Technology, 2012). There are numerous opportunities for students to attain funding for higher education, especially in STEM-related fields. The amount of STEM courses and programs offered have

increased greatly since the A Nation at Risk report first focused attention on the US falling behind in these areas (Gardner, 1983).

The increase in attention and initiatives aimed at improving the number of skilled workers in STEM-related fields has had a positive effect on the number of skilled workers entering the workforce. However, there is still a deficit when compared to the available jobs and the forecasted growth in these areas. The increase in the number of students pursuing STEM coursework has, in turn, led to a demand for training. This means that to train workers in STEM fields, the US must also bolster the number of programs and educators in STEM fields as well. The shortage of skilled STEM workers has created a shortage of STEM educators worldwide (Dee & Goldhaber, 2017; Harvey & Gimbert, 2007; Larios et al., 2022; Parker & Brindley, 2008; Williams & Forgasz, 2009).

The United States must have STEM educators to train the new STEM workforce that is needed. The problem is that the number of STEM educators is actually declining due to lack of retention in education and an aging teacher workforce nearing retirement (Gifford et al., 2013; Koehler et al., 2013; Lee & Lamport, 2011; Parker & Brindley, 2008; Podolsky et al., 2016). A search for STEM-related teacher shortages shows that every state lists shortages in these areas (School and Staffing Surveys, 2012). Schools, especially low socioeconomic and urban schools, are the most affected (Dee & Goldhaber, 2017; Zhang & Zeller, 2016). This is also a factor in the education gap that has plagued the US.

Recently, there have been a few studies that have questioned the existence of a skilled labor shortage (Capelli, 2015; Salzman, 2013; & Stevenson, 2014). Although

there is always room to question bias in research, overwhelmingly the research supports the existence of a gap between skilled labor jobs and the number of candidates being produced. The President's Council of Advisors on Science and Technology (2012) believes the shortage exists and suggests that by raising retention and completion rates in STEM fields by as little as 10%, the shortage could be significantly reduced. Persistence to completion of a degree could be improved through better pre-college educational preparation which, again, comes back to the need for more highly qualified STEM educators.

Statement of the Problem

The problem facing education is a current and projected shortage in the number of STEM educators. Alternative certification (AC) programs have been instituted to increase the number of educators in STEM-related fields. Many states have implemented AC programs aimed at transitioning current career professionals into the education field (Harvey & Gimbert, 2007; Kirby et al., 1989; Lee & Lamport, 2011; Washburn-Moses, & Rosenberg, 2008). AC programs have exploded in popularity and currently produce almost 30% of the new teachers entering education in 2018-2019 (Fenwick, 2022). With the dramatic increase in the number and popularity of such programs, there have been questions as to whether this is a viable option for producing quality new teachers. Temporarily this has helped, but is it a good long-term solution?

Because there are so many diverse types of alternative certification programs, teachers graduating from these types of programs are exposed to various levels of educational training. Some programs are lengthy and very structured, providing an experience similar to traditional teacher training programs. In contrast, some AC

programs are designed to get teachers into the classroom quicker and, therefore, are less structured. Because there is no national standard for AC programs, the amount of coursework and student teaching requirements differ greatly (Boe et al., 2007; Carter & Keiler, 2009; Chait & McLaughlin, 2009; Jeanpierre, 2007; Kirby et al., 1989). This has led to questions about the quality of AC programs and the quality of teachers they produce.

Even though research has been conducted on numerous programs to determine the program's effectiveness, more research must be done to determine how various amounts of pedagogy, supervised teaching, and prior experience affect educator quality (Boe et al., 2007). Because there are so many variations within AC programs, AC programs must be studied to narrow down specific components that comprise a high-quality AC training program. The teacher shortage is a problem and alternative certification may help to provide an additional avenue for teachers to enter the profession. Bowling and Ball (2018) question whether alternative certification programs adequately prepare teachers for the classroom. They further contend that this lack of preparation may create just another problem for education through higher turnover (Bowling & Ball, 2018).

Purpose of the Study

The purpose of this study is to gain an understanding of the experiences of STEM teachers who have completed the Master of Arts in Teaching (MAT) program at the University of Central Missouri (UCM) compared to those completing a traditional teaching preparation program. The MAT program is an AC program designed to allow individuals who currently have a bachelor's degree in another field a path to earn initial teaching certification. The MAT program at UCM is an AC program that includes

coursework in pedagogy along with a supervised internship. The supervised internship takes the place of a separate student teaching internship and is usually conducted while the student works full-time as a first-year teacher.

This study will compare the experiences of MAT teachers in their first few years of teaching with teachers who graduated from UCM through the traditional teacher education program. Post et al. (2004) suggest that MAT programs have several quality control features which make them different from traditional programs, and the requirement of a bachelor's degree will ensure deeper content knowledge. Zhang and Zeller (2016) specifically allude to the requirement of a bachelor's degree as being significant to enter an AC program.

Evans (2010) contends that the argument over which certification route produces the most competent teachers is unresolved. Current research indicates that AC teachers are not as successful (Bowling & Ball, 2018; Fenwick, 2022), while Dee and Goldhaber (2017) caution about making claims about effectiveness based on conventional certification.

The study will compare these experiences to identify differences between MAT teachers and traditionally trained teachers. If the experiences are similar, it would mean that the MAT program is producing equally qualified teachers. It would also validate the teacher preparation practices utilized within the MAT program at UCM. The results could then guide future research and AC program design.

Research Questions

The research questions guiding this study are:

1. What curricular or professional experiences do teachers consider to be critical to their success as a teacher?
2. How do graduates of the MAT and traditional programs perceive their preparedness to teach?
3. How do graduates of the MAT with prior work experience and traditional program graduates perceive their comfort in classroom management, content, and pedagogy?

Theoretical Framework

Throughout the research, it is evident that scholars believe there are certain qualities of teacher certification programs that produce high-quality teachers such as pedagogy training and supervised teaching (Boe et al., 2007; Harvey & Gimbert, 2007; Salgado et al., 2018). In this study, one focus will be on identifying which characteristics of the MAT program at UCM are effective in meeting that goal. The assumption is that certain aspects of the program will cause expected outcomes related to teacher quality.

Another key component will be focused on the teacher candidates themselves. Research and practice suggest that higher-quality candidates are supposed to produce better teachers. This is evident by the reliance of education programs on entry-level requirements. The Council for Accreditation of Educator Preparation, a national accrediting body for colleges of education, previously recommended increasing the rigor for those entering teacher education programs by raising entry-level criteria to a minimum of a 3.0 GPA and having a score in the top 50 percent on national and state

normed tests in reading, writing and math (Standard 3: Candidate Quality, Recruitment, and Selectivity, 2015). Although there are some university programs that do not have minimum entry score requirements for entering the college of education, many colleges and universities have higher requirements to enter the college of education above the basic entry to the institution. The logical reasoning behind this fact would be that higher entry-level scores are expected to produce better teacher graduates.

The expectation is that graduates of traditional teacher preparation programs and alternative certification programs will successfully apply the skills and knowledge learned in class to the classroom. Many colleges measure their success by the transferability of the graduate's skills to the workplace (Green, 2013). Macaulay (2016) defines transferability as the "application of skills or knowledge learned in one context to another" (p.100). Several researchers have suggested that transfer of learning is the fundamental idea of traditional education and that students demonstrate the concept when they apply in practice what they have learned in theory (Botma et. al, 2015; Day & Goldstone, 2012; Green, 2016). This theory is nothing new, and it is a derivative of the seminal work by Woodworth and Thorndike (1901), who conducted several studies demonstrating that the improvement of one mental function may have positive effects on other functions.

Day and Goldstone (2012) contend that the transfer of learning does not happen as directly as many theorists would describe and that there are many factors affecting transferability from theoretical learning to application. This study will use the transfer of learning or transferability theory to examine the differences in application based upon the prior learning experiences of those who have prior work experience in a STEM-related

field and those who graduate from a traditional teacher preparation program (Day & Goldstone, 2012; Nokes-Malach & Mestre, 2013). The study is trying to understand how skills learned through real world experience and traditional teacher preparation programs are applied classroom experiences.

Design of the Study

Setting

The University of Central Missouri is located in Warrensburg, a medium-sized town of approximately 19,000 people in the heart of Missouri, approximately 60 miles east of Kansas City. The town has a mostly rural and farming history but is influenced strongly by the university and neighboring Whiteman Air Force Base. For these reasons, the town has a strong emphasis on education and is more culturally diverse than most similarly sized towns in the Midwest (Fast Facts, 2023).

The university has a strong bond with the community as it is the main draw to the town, and the 14,000 students attending UCM greatly enhance the local population. The university offers more than 150 programs of study from undergraduate and certification programs through doctoral cohort programs. UCM has a strong reputation in the fields of education, nursing, criminal justice, and computer technology (Fast Facts, 2023).

The focus of this study is the MAT program. This program is part of the College of Education and is intended for career professionals seeking to earn teacher certification. In order to apply for the program, a candidate must have completed an undergraduate degree with a minimum 2.75 grade point average. Students can enroll with either a high school or middle school focus in more than twenty areas of concentration (Master of Arts in Teaching, 2023).

Methodology

The design of the study was a qualitative case study. Qualitative design matched the focus of the study on the experiences of the teachers in the classroom. According to Creswell (2014), qualitative research is applicable to situations where the variables are not defined and controlled. This process is referred to by Merriam and Tisdell (2016) as being inductive, where meaning is being derived through the process of research rather than trying to prove or disprove a predefined theory or hypothesis. The research process was designed to understand or derive the meaning behind a phenomenon or situation.

Qualitative research also focuses on the personal experiences of the participants involved (Creswell, 2014). This related directly with the basis of the study focusing on the perceptions of STEM teachers graduating from the MAT and traditional teacher preparation programs. From these experiences, an understanding of how prior experience impacts teaching preparedness was developed.

Beyond being strictly qualitative, this study fits the definition of a case study. Merriam and Tisdell (2016) describe a case study as being similar to other approaches of qualitative research in that the researcher is the primary instrument, the process is inductive, and the focus is on meaning and understanding. In addition, a case study is typically bounded by a finite number of individuals or amount of time (Merriam & Tisdell, 2016). In the case of this study, there was a limited number of STEM graduates for both the MAT and traditional programs at UCM. Therefore, this study was approached as a qualitative case study.

Participants

Participants for this study were selected based upon successful completion of the MAT or traditional education program at UCM specializing in a STEM certification area and having taught for at least one semester after completing the program. This type of purposeful sampling is common in qualitative research where the researcher wants to understand or gain insight about a specific case (Merriam & Tisdell, 2016). The participant pool was identified by contacting the academic advisor for the MAT program and the certification office for traditional candidates. The study was able to collect data from 10 traditional students and 7 MAT once all available means had been exhausted to contact graduates identified through the certification office. Purposeful sampling is appropriate due to the bounded constraints of the programs being studied (Merriam & Tisdell, 2016).

Program acceptance and requirements were acquired from the university website and triangulated with participant experiences for validity (Creswell, 2014). State certification requirements were validated by referencing the Missouri Department of Elementary and Secondary Education website. Merriam and Tisdell (2016) suggest using multiple forms of data and collection methods to triangulate results for reliability and validity reasons.

Data Collection and Analysis

Each of the participants was interviewed and the interviews were then transcribed for analysis. Each interview lasted approximately 30-60 minutes in length and was recorded and transcribed.

Transcribed interviews were examined for common categories and themes. Seidman (2013) suggests reading several transcripts and identifying interesting data excerpts from each, then developing categories from which common themes can be developed. Merriam and Tisdell (2016) describe a similar process using open coding and then narrowing categories down by axial coding. It is also a common mistake to try to develop themes too early in the process and then try to force new data into existing themes, thereby misconstruing data from the onset (Seidman, 2013).

Data from this study was processed following the steps outlined by Seidman (2013) and then axial coding to narrow the number of categories. Interviews were read and interesting facts identified. A minimum of three interviews were processed before any categories were developed. In addition, a theme was considered when at least three individual participants describe a common idea. Themes were then analyzed and combined until a recommended number of 5 to 7 major themes were developed (Creswell, 2014; Merriam & Tisdell, 2016).

Merriam and Tisdell (2016) suggest using triangulation to ensure internal validity of the study. This means using multiple methods or sources to validate the outcomes of the study. In addition to interviews, an analysis was performed using the website and the course catalog to determine and compare the curricular components of each program. It is a good idea to use multiple methods of data collection to improve validity (Creswell, 2014; Merriam & Tisdell, 2016).

Results were also compared to existing research to strengthen the reliability of the study through triangulation and build on the ability to generalize the results. Although qualitative studies are usually not generalizable, if several studies show similar results, a

generalizable theory may eventually be developed or applied through user generalizability (Creswell, 2014; Merriam & Tisdell, 2016).

Definition of Key Terms

Alternative Certification. A program to achieve an initial teacher certification that is not a traditional teacher preparation program.

MAT Program. A graduate program for professionals who already have an undergraduate degree in a field other than education, leading to an initial teaching certificate to become a teacher.

MAT teacher. An individual who has completed the MAT program and is or has worked as a classroom teacher.

Nontraditional teacher. An individual who has completed a teacher certification program other than the traditional teacher program or the MAT program as defined above and is or has worked as a classroom teacher.

STEM. Science, Technology, Engineering, and Mathematics. In the context of the study, any teacher certified in these areas or teaching a course in these areas will be considered a STEM teacher.

Traditional program. An undergraduate program designed for students who have graduated high school and are seeking to earn an initial teaching certificate to become a teacher.

Traditional teacher. An individual who went through a traditional teaching program and is or has worked as a classroom teacher.

Findings

This study attempted to determine the feeling of preparedness of teachers entering the classroom from the traditional program or the MAT program at UCM. The focus was on the experiences that teachers had before entering the program that helped them be successful. The research questions gathered perception data related to different aspects of teaching and preparation to investigate the connections between preparation and preparedness for these two groups of teachers. The following is an overall directory of participants and then a discussion of the themes and results for each research question.

Table 1: Directory of Participants

Name	Program	Years	Subjects	Previous Occupation	Grade Level
Sara	BS	2	Biology, Chemistry		9-12
Steven	BS		Coaching		College
Sam	BS	8	Physical Science, Chemistry		9-12
Sally	BS	8	Science, STEM		6-8
Stewart	BS	5	Life Science, Physical Science, Integrated Science		
Stacy	BS	5	5 th Grade Science, Math, Geometry, Alg. 2, Trig., Statistics, Pre-Algebra, Geometry, Applied Geometry		5, 8, 9-12
Shirley	BS	7	Math, Algebra		6-8
Scott	BS	6	Math, Leadership		5-8
Susan	BS	5	Geometry, Integrated Math, Trigonometry, College Algebra, Calculus		9-12
Sheila	BS	6	Science, History		6-7
Jennifer	MAT	7	Chemistry, Drums, Theoretical Chemistry, College Prep	NA	10-12
Joan	MAT	2	Math, Project Lead the Way, Physical Science	Business Marketing	6-7
Julie	MAT	3	Agriculture	Ag Industry	9-12
Jessica	MAT	11	PE, Art, Math, Science, Current Events, MS Reading	Law Enforcement	K-2, 6, 9-12
James	MAT	5	Algebra 2, Geometry, Pre-Calculus, Geometry in Construction	Engineering	9-12
Jane	MAT	4	Project Lead the Way	Healthcare	7-8
Joy	MAT	17	Business, Finance, Personal Finance, Elementary Sped	Corporate Sales	K-4 7-12

Themes

When the data were being analyzed, three themes were consistent within the research. First, traditional teachers and MAT teachers reported similarly when asked about coursework and professional experiences that were most valuable; about their feeling of preparedness; and their comfort in classroom management, content, and pedagogy. Second, both groups of teachers preferred application and methods style courses and pointed to observations and student teaching as valuable curricular components. Third, all experiences, both professional and personal, proved beneficial when entering the classroom. These themes became apparent as most participants had similar stories during the interview.

Traditional and MAT Similarities

When asked about coursework and professional experiences that were most valuable, about their feeling of preparedness, and their comfort in classroom management, content, and pedagogy, the responses were similar for traditional teachers and MAT teachers. This aligns with the research that suggested that the experiences of teachers entering the classroom were similar regardless of their path to certification. This is important for two reasons. First, research can continue without regard to the type of certification program and instead focus on the specific issues teachers are experiencing. Second, any possible solution or implication could hopefully be applied to any preparation program.

Application and Applied Coursework

Again, when asked about what type of curricular components that were part of their teacher preparation program were beneficial, there were numerous responses that

discussed application and applied coursework as being the most important. Students preferred courses that were directed at how to teach the content rather than just learning the content. They preferred courses that were less theoretical and more application based. Finally, many of the respondents claimed that getting into the classroom and student teaching was where they finally developed as a teacher. Observations came in as a close second to student teaching in curricular experiences that teachers reported as beneficial.

All Experience Helped

Finally, when asked about what experiences outside of teacher preparation benefited them when entering the classroom, almost everyone had a story that connected some previous experience with how it helped them in the classroom. This is where things shifted slightly between the two groups. Because MAT teachers were typically older and had professional experiences after completing their original degrees, the results did not match entirely.

Several MAT teachers reported that their professional experiences related to the content they teach in the classroom. They also reported feeling more comfortable entering the classroom simply based upon their level of maturity. Lastly, a couple of the MAT teachers reported feeling more prepared because they are parents whereas only one traditional teacher reported being a parent and they also felt that was beneficial.

Teachers from both groups did speak positively about other job-related experiences and personal experiences that benefited them in intangible skills. It became apparent from their stories that any type of job, leadership, and extracurricular experience benefited them in areas of management, communication and relationship building.

Several also made connections to their own personal experiences, such as dyslexia or being part of the LGBTQ community, as helpful in relating to students.

Research Questions Answered

RQ1: What curricular or professional experiences do teachers consider to be critical to their success as a teacher?

The main findings for research question number one were that the experiences of MAT and traditional teachers were similar. Prospective teachers found applied curriculum that was targeted towards teachers as beneficial compared to strictly learning content or theory. Student teaching and observations were curricular components that most agreed were the best teacher preparation experiences. Technical work experience was valuable for those who had that experience, typically MAT graduates. Life experiences and maturity also played a role in the experiences of teachers entering the classroom.

Applied Curriculum

Teacher candidates preferred courses that were focused on teaching the content and were application based. Susan discussed the type of courses for teachers, “I don't remember the specific name, but they were math teacher-focused, so we were only math teachers in there. I think there was a middle and high school levels... That is what I really felt prepared me for the classroom.” Sally recalled her content courses, “I think that if I were to go back and change one thing, it would have been to have more of those science classes that were education based rather than general science.” Joan reiterates the need for strategies courses, “They all focused around the same thing... One of the classes was

the one with the lesson planning. I think that one was called instructional strategies for middle school mathematics...”

Student Teaching and Observations

Overall, student teaching and observations were considered invaluable. Sam describes his student teaching, “The student teaching was like having your boots on the ground. Being in the classroom definitely helped...But where we actually got experience in a real classroom helped more than anything else did...” Others discuss the benefits of observations. James proposed, “I think as much shadowing or observation that you can do the better.” Jessica wished, “I wish that I would have done a more varied teacher observation” Stacy expressed an interest in more observations, “Honestly, I think I would have figured out a way to go in and do more observations.”

Technical Experience

Technical work experience was beneficial to support content. This is one of the main differences between the two groups of participants because MAT teachers typically have professional experience beyond a typical entry level job. James tied it all together with this comment:

I got a bachelor's degree in civil engineering. I worked in the industry for eight years as an engineer and a project manager...there's a huge relationship between managing a crew of adult men and women and a classroom. Even though it might not sound like it, my project management role was overseeing and managing personalities, people, and relationships between us and the client...effectively leading meetings, being able to be a leader, but also letting people speak and listen. And so that directly relates to teaching. I'm able to bring those skills into

the classroom. I know how to best equip kids to work together, work with me, and hopefully those leadership skills I brought translate to the classroom.

Julie also describes how her experience in the agricultural industry applied to her classroom and relatable experiences to teaching FFA.

I did a lot of like public speaking events then, which obviously helps with having kids in the class and standing up and then being and being able to help them with those same skills... With my previous job, I conducted meetings to educate farmers. I worked with a lot of older men, and I wanted to bring my knowledge to students so they could benefit from FFA in the same way that I did...I brought like ten years of experience to the classroom with that background.

Jessica credits her experience and training in Law Enforcement for being able to adjust to situations in the classroom. She shared,

I have a background in law enforcement so, conflict mediation, clear and concise communication, those were two things that I think really keep a pretty calm head, and especially at the alternative school when emotions were high. I was able to keep, just a calm open mind.

Joy has worked in business and management for several years and had this to say about her experiences and how they relate to the classroom,

I always say that being in the business world for seven years...all of those professional experiences helped me be a better business teacher. I also owned a couple of small businesses during that time and so that's why I told the students, I know what businesses are looking for. I know what software is being used.

Life Experiences

Family and life experiences helped make them relatable as new teachers.

Jane credits being a parent as being extremely helpful, “Now as a teacher, being a parent first I think has been incredibly helpful.” Shirley also shares, “I went into the classroom as a mom, so I had a little bit of a mindset of how would I want my teacher or my daughter's teacher to treat her? So, I felt like that helped me guide how I taught my classroom and how I handled things.” Sheila describes how her personal struggles made her relatable as a teacher.

Then being dyslexic, I can read fine, but I switch and mirror image things a lot.

So, like in Kansas City, where I grew up my whole life, there is 435 highway and I'm always looking for 534 highway and never remember that I flipped the number myself...Like when I would catch a kid doing something like that, I'd be like, oh, I do that too and this is how I learn to do it.

Scott attributes his success to his personal experience,

Myself I endured a pretty heavy amount of trauma growing up. So being able to relate to students on that level. My strength is definitely in teaching and learning with kids with social, emotional, behavioral issues or struggles and just being able to relate to them because of issues with being part of the LGBT community and not really being in an area where that's accepted. I think that really prepared me the most for how these kids feel, and being able to handle the level of stress that a lot of them do. Learning from tough times is really going to help you when you struggle, and you have those experiences. I think that's what helped me the most as far as becoming a good teacher.

Maturity

Even though the experiences of MAT and traditional teachers is generally similar there are a couple of differences. One of those differences is related to age or maturity. Many of the MAT teachers credit their success or their preparedness to being older and more mature. Jessica said, "...a part of that was I've had other careers in managing people and I was older. I wasn't a 21-year-old stepping into a high school classroom. I have a little more life under my belt...I do not think that 21-year-old me would have been a fabulous teacher." Joan agreed with her own statement, "I feel like I'm more equipped to teach because I've got some life experience behind me. I'm a little bit older than a normal second year teacher would be." James stressed the importance of experience for new teachers, "Because I was older when I went through and did this, I was 31 to 33-ish. When you're talking about 19, 20-year-olds just starting out right out of high school, and they're in an education program they need to hear they need more experience, more experience."

As you can see, the MAT teachers, since most of them are older, credit this to some of their preparedness in the classroom. Sally gave us a glimpse of the opposite viewpoint as she shared her experience,

I think I was most unprepared for community and parent communication as an educator. Going into the work field and working with middle school aged students as a fresh 22-year-old I did have some parents that maybe didn't see me as a professional. They would be fine over email communication. Then they'd walk in during conferences, and were like, oh my gosh, are you old enough to be a teacher? You look like my child's age. That created some boundaries that were

difficult to break down. I felt like I was constantly trying to prove my worth, and I was the only new hire straight out of college that my district had had in a while and has had since then. So, I'm still one of the youngest in my group of teachers. That's definitely had an impact on the kind of communication skills that I've had to develop with community members that maybe view my input as a new way of teaching. I'm not coming from a structured background that they feel like they necessarily have had. Talking with parents, sometimes is getting better now that I'm aging. But I felt like parents originally didn't see me as an equal adult, rather as a young adult that may or may not actually know what I was talking about. So, I think that was an area that I struggled trying to make sure that people knew that I am a professional. I know what I'm doing.

In Sally's story you can see her struggle as she had to combat discrimination from some parents due to her age even though she is a fully trained, capable, and qualified educator.

RQ2: How do graduates of the MAT and traditional programs perceive their preparedness to teach?

Research question number two also showed the perceptions reported were similar for traditional and MAT graduates. They reported that any experience was beneficial when entering the classroom even if it was not directly related to content. These non-content experiences were beneficial in developing intangible skills such as communication and relationship building. Furthermore, teachers that reported being parents shared that the experience with their own kids influenced them positively in relating to kids in general. Most teachers thought that the workload was a concern but due to other professional experiences, MAT teachers seemed better prepared for the time

commitment. Finally, mentors and peers were very helpful to new teachers adjusting to the classroom but there are situations in which the quality of mentor cannot be controlled.

Experience Benefits

First, any professional or volunteer experiences outside of traditional education proved to be of benefit. Steven discussed the benefits of sports,

Leadership all came from sports. I had a couple of part-time jobs that I would work in the summers or every Christmas break. I don't know if those helped me in the classroom. It's probably more the relationship side. I always took time to build relationships with my teachers, coaches or my managers, etc., and that probably helped in school when I had to interact with other(s)...

Stewart recalled his experiences working at a fast-food restaurant,

I can remember the positive communications, especially at Chick-fil-A. I remember there are a lot of times when you're just learning to be relatable. The corporation encouraged you to try to get to know the person and try to figure out what makes them feel valued. And so, you would learn to look for things that they were wearing. Was that something that I could talk to them about? Finding these relational connections with other people translates directly to the classroom as well...

Intangible Benefits

Second, many of the benefits were not directly tied to the content of the course. Many of the experiences that respondents deemed helpful were directed at intangible skills such as communication and relationships. Scott explained how his time in the food industry prepared him,

I do think working in food service, surprisingly, was some of the most beneficial experiences that I had because it taught me how to think on my feet and talk with people. When you're working for tips you have to be able to engage with different people. So, I think that was my professional experience. But it helped me, especially in engaging with families and students. It just prepared me for a bunch of different situations and even difficult times if there were difficult parent phone calls. If I've been yelled at about pasta, I think I can handle someone who's having a difficult time with their child. That seems a bit more serious. I was prepared for those difficult conversations after working food service.

Jennifer volunteered to work with a youth drumline, which helped prepare her.

It really helped me gain an understanding of how they think and how they function. And so being able to do it, not necessarily every day, because drumline was just a couple nights a week, but it was already getting to work with high school students.

Parenting Helped

Third, respondents who identified as being parents indicated that the experience of being a parent helped them. Jane explained how being a parent helped, “Now as a teacher parenting, being a parent first I think has been incredibly helpful... I mean, it's hard to say I'm a parent, so I think that that lends itself to help more so than the courses that I was taught, if that makes sense.” Joan also thought parenting was beneficial, “The mom comes out a lot because I have three boys of my own... I feel like being a mom prepared me more for classroom management than necessarily a specific class that I took at school.” Shirley shared her thoughts on parenting and teaching,

Like me, I went into the classroom as a mom, so I had a little bit of a mindset of like, how would I want my teacher or my daughter's teacher to treat her? So, I felt like that kind of helped me guide how I taught my classroom and how I handled things.”

James also shared about parenting, “I had a child by then. I feel, even with a young child, seeing things, seeing strategies that work for behavioral issues and calming them down or motivating them can also work at a high school level. So, I brought those into it.”

Workload Concerns

Lastly, many of the teachers indicated workload as a concern but MAT teachers are more comfortable with the demands. Jennifer said, “I was working for many hours trying to get it prepared and ready for the week. I think if I struggled with something, that would probably be the biggest one.” Stewart recalled his time as a new teacher,

So unprepared for the amount of workload that a teacher must carry out. In year one had many, many, many, many late nights where I would work off the clock unpaid to accomplish what was supposed to be occurring throughout the day. But there just wasn't the time. I wasn't prepared for that.

There was sentiment with a couple of MAT teachers that the workload was part of the job. Joan discussed how she related the work to previous experiences,

I've already had a different job, which was also a salaried position. So, it didn't matter how many hours I worked, whether it was more or less than the standard, 40-hour workweek or whatever. This is your salary so do this job. So, you need to make sure you do this job. I just feel like that gives me a different mindset when it comes to teaching.

Jane described her appreciation of the job and the time commitment,

I think working in small businesses for a lot of years made me appreciate the job.

I think a lot of teachers get very negative to the profession. We don't get paid enough; we don't have enough time. I just kept thinking this is the highest I've ever gotten paid. And I get the whole summer off. I feel like having a life experience somewhere prior helps me be a more productive employee.

Mentoring Helped

Most teachers reported that when they felt unprepared or needed some help they had a strong and positive connection with a mentor in their building whether it be a formal mentor or simply a peer. Sara responded, "...the biggest help, was the instructional coach, my mentor teacher. Still talking to just my regular coworkers, really, really helped." Sally recalled getting help from her mentor,

The mentor that I was set up informally, was a math teacher down the hallway, and she was an amazing resource. Her experience that she'd been at the district just a little bit longer than me was significant in helping me kind of get my bearings on things...

Jessica also reported a positive mentor experience,

I worked two years with a veteran teacher...because every school district has their own unique ins and outs and policies. As a newbie, you might not understand. I thought that the mentor program at the district was really good.

However, not all mentorships have the same results. Sheila and Joy both discuss having mentors that did not teach the same subject. Joy felt that, "There was no mentor because I was the one and only business teacher." Sheila also expressed disappointment

that, “No, the middle school did not. They had teams.” A mix of subject area teachers. Joy further goes on to describe a situation where the mentor was not interested in helping, “I remember that lady from that school. I think her words were something like, don't bother me. I'm your mentor. I'll check in with you when I want to.”

RQ3: How do graduates of the MAT with prior work experience and traditional program graduates perceive their comfort in classroom management, content, and pedagogy?

For research question number three, in line with the literature and among both groups, the results were similar. Most felt very comfortable with the lesson planning, curriculum and content aspects of teaching. Classroom management was by far the area that most attested to struggling when first entering the classroom. There were a couple of MAT teachers that contradicted that trend and explained that they had experiences before becoming educators that prepared them for this challenge.

Lesson Planning

In terms of lesson planning, participants felt possibly overprepared. Sam described how he felt in relation to lesson planning:

I felt completely prepared with lesson planning and actually almost over-prepared for lesson planning, because of the stuff that I learned at the University of Central Missouri... formal lesson plans and all of that weren't all particularly required in the district that I worked at. So, I felt over-prepared.

Sally shared her experiences with lesson planning that first year:

We would write out lesson plans. They were not necessarily structured lesson plans like filling out a worksheet or a template. We would focus on the steps that

we were going to complete, more like a bullet point list. Then we would put in little bits of details where we felt like we might need a reminder and then we also associated that with the amount of time it was supposed to take. Doing that heavily transferred over and helped me significantly with my first-year teaching.

Curriculum

Curriculum was an area with mixed reports but mostly positive, especially if there was a good curriculum in place already. Sally shared how she was mostly comfortable with curriculum,

Initially, going into my career in education, I think that I had a really good understanding of textbook curriculum in the sense that, like, I knew how to read curriculum. I knew how to structure it and create it and derive a lesson plan, but I struggled a little bit with the implementation.

Joy felt comfortable because the curriculum at the state level was well developed. She stated,

Well, curriculum wise, I have I've always said I was fortunate that I entered teaching at a time when DESE and the DESE business and marketing department were very strong. They had a curriculum for each of the subjects I was teaching... the others were jealous. They were like, all you had to do was go pull that up? And I'm like, it was right there. So, I felt supported by that.

Classroom Management

Classroom management was, by far, the biggest struggle for most, although a couple of MAT teachers reported that they did not struggle as much with classroom

management due to their past experiences. Sara reported, “I felt woefully unprepared. Horribly, horribly.” Shirley responded,

I don't feel like anyone's ever really prepared to go into a classroom. No matter how many times you talk about classroom management. I mean, until you really get hands-on control of your own classroom, I don't really think anyone's prepared to walk into a classroom.

Scott also found it difficult to prepare before you actually get into the classroom.

I think that's probably what I struggled with the most. But I think that's also such a hard thing to do. I feel like I knew my philosophy, I knew what I wanted to do, but really, until you're in the classroom and until you're in that situation with the kids, you have to be malleable.

MAT Classroom Management

A couple of MAT teachers did however report feeling comfortable with classroom management due to previous professional experiences. Joy commented,

...coming from the business world, that clicked with me because I knew there were procedures to do everything, you know, in a business. So that I followed those methods and that really helped me in the beginning with classroom management.

Jessica cited her previous business experience as an advantage when she shared, “Very prepared. But again, a part of that was I've had other careers in managing people and I was older. I wasn't a 21-year-old stepping into a high school classroom. I have a little more life under my belt.”

Implications

After examining the results of the research there are several improvements that could be made to help future educators. When examining recruitment or enrichment for future educators, admissions and programs should stress the importance of extracurricular and job experiences of any kind. Outreach for aspiring educators should promote experiences that develop intangible skills and not focus strictly on education or content.

Teacher preparation programs should strengthen observation and student teaching components. This could prove difficult, especially for the MAT program, as many educators work as classroom teachers while simultaneously completing the student teaching requirement. It also has been impacted by emergency licensures and COVID restrictions, where many teachers enter the workforce before completing the student teaching experience or a significant number of observations.

If possible, observations should occur from the beginning and continue throughout the program. Teaching candidates could be required to visit a variety of classes, grade levels, and districts through course requirements. Student teaching for those not working as a classroom teacher, should occur in more than one environment and should be varied by district, demographic, and subjects or grade levels.

Teacher preparation should focus more on application and less on theoretical knowledge to better align with the expectations of new teachers. Courses should be teacher-specific and examine how to teach the content over just learning the content. The skills learned should be more aligned with what teachers will actually be using on a daily basis. For example, it is ok to teach a well-researched and defined lesson plan but then use this as a guide to develop practical lesson plans, ensuring that the everyday style of

lesson planning meets the requirements and intent but in a more compact and applicable form is important.

The university should seek to strengthen the experience of curriculum alignment among teaching candidates by providing a curriculum share database for educators. Teachers in the teacher preparation program would learn the skills to develop curriculum while maintaining the database. Graduates would have access to links and access to a rich curriculum that has already been aligned to the state standards for various courses. It would include the essential standards, learning targets, and suggested activities already aligned to the state standards for a particular course. This would alleviate much of the stress and workload on new educators.

Other stakeholders could also benefit from this curriculum sharing. School districts would benefit by not having to invest in their own curriculum development. All teachers and students would benefit from a well-designed curriculum that allows teachers to focus on learning and implementation rather than curriculum development. A well-defined and aligned curriculum services all stakeholders.

The university could further this concept by assisting regional schools with resource alignment. After developing the curriculum share, resources still need to be connected with the learning objectives. Teachers must learn this skill in their preparation so why not have them work on actual schools that need alignment so that everyone benefits? Teacher candidates could learn all the curriculum development skills and develop a better understanding of individual curriculums while creating the very curriculum they may be using when they get to their first job.

The state of Missouri requires school districts to provide a mentor to new teachers and for completion of the Beginning Teacher Assistance Program objectives within the first two years in the classroom. Most teachers reported positive benefits from some form of mentoring, be that a formal mentoring program or just peer connections. However, the quality of the mentor cannot be guaranteed in each scenario. Smaller schools may not have another teacher in a similar content area or available at the same time due to scheduling.

UCM does bring back graduates for a one-day networking check-in with their graduated teachers. It would be worth expanding this support system for recent graduates after they move into their first years of teaching. A place where teachers in their first couple of years can reconnect with other first year teachers, especially if they are from smaller schools or need after-hours support on those late nights, could be created. This could take several forms, based upon what the students show interest in. Possibilities include a Facebook group, perhaps by topic area or even a peer or faculty monitored support group. This could work in correlation with the Curriculum Share concept previously proposed. This could serve as a form of assistance for those late nights where many new teachers are left alone to figure it out.

Further Research

Several key areas lend themselves to further exploration. First, it would be interesting to explore the differences between the teachers' experiences during their first year and second year of teaching. Second, while searching for study participants it appeared that many who were certified were not currently teaching. These licensed but not teaching educators should be given a voice. Third, non-STEM teachers' experiences

could be studied, as the MAT reaches beyond the STEM fields. A fourth study could compare the attrition rates of traditional path teachers as compared to MAT teachers.

Limitations

The study was limited in several key areas. First, the study was limited to 17 teacher participants: 7 from the MAT program and 10 from the traditional program at UCM. This small sampling may illuminate indicators that, given a larger sample, may not be as prevalent.

Additionally, the results will be limited to graduates from UCM. Other types of programs may produce different perceptions of preparedness in teaching candidates based upon their learning and experiences. These different preparation programs may not show the same relationship toward the transferability of professional skills to the classroom.

Finally, participants were identified through UCM as graduates of the MAT or traditional programs. These participants were then contacted en masse until ten respondents from each program were willing to participate in the study. Unfortunately, after various attempts to contact teachers, only 7 MAT teachers were located and willing to participate in the study. Due to the self-selective nature of enrolling participants, there may be some bias in their choice or reason for participating.

Significance of the Study

STEM teachers are needed if the United States is to increase the number of STEM graduates and meet the skilled labor needs of the nation. This study will inform national and local policymakers about the feasibility of MAT programs and the benefits of prior work experience to teachers new to the profession. If the study shows that teachers who graduated from the MAT program at UCM are equally or more prepared as teachers from

traditional programs, then AC programs can be invested more heavily to meet the teacher demands of producing more skilled laborers. Programs that aim to attract STEM professionals to the education field could also be expanded. Within the study, there may also be some curricular components of both the MAT and traditional programs that are critical to designing AC programs that, combined with other research, will guide the creation or evolution of AC program standards.

This study explored the preparedness of UCM's MAT graduates and that of traditional teacher candidates. This validated and identified discrepancies in either program related to the preparation of new teachers to feel prepared in entering the classroom. From this research, both programs could be expanded or modified to improve teacher preparedness and increase the number of teachers entering the STEM fields. The study highlights curricular and prior experiences that teachers felt are valuable to being a teacher. This information could be used to modify existing curriculum and field experiences to benefit teacher preparation.

This study was built upon current research that has been conducted on the effectiveness of AC programs (Bowling & Ball, 2018; Fenwick, 2022; Pankowski & Walker, 2016). It illustrates that prior experience and certain aspects of curricular components are shown to be effective at UCM. This research can then be combined with other research focusing on AC programs to help identify specifically which types of curricular or field experience combined with prior knowledge and experience yields the best results in teacher preparation programs. The results of building the knowledge base concerning AC programs can then be used on the national and local levels as discussed previously to guide program design and development.

Summary

This qualitative research project attempted to understand how well prepared traditionally trained teachers and MAT graduates are to teach in the STEM fields. Currently, AC programs are becoming more widespread, but the differences between programs make them difficult to compare (Bowling & Ball, 2018; Sutcher et al., 2019). This research focused on the difference in graduates with prior work experience before entering the MAT program and graduates from the traditional teacher preparation program specifically in STEM-related fields.

Through identification of aspects that teachers in the MAT and traditional programs find most helpful in making them feel prepared for the classroom, this study has informed future and current teacher preparation programs. If it can be shown through numerous research projects that there are certain curricular components that lead to producing quality teachers, then this information could drive teacher preparation policy and programs. To meet the demands for more skilled labor in the United States, more highly qualified STEM teachers are needed. It is this researcher's hope that improving teacher preparation programs through the knowledge gained in this study, the gap between the number of teachers needed and the number of new teachers adequately prepared to enter the work force will narrow.

SECTION II: PRACTITIONER SETTING FOR THE STUDY

Introduction

The University of Central Missouri's College of Education is nationally accredited and is one of the oldest teaching colleges in Missouri, dating back to its origination in 1871 (Fast Facts, 2023). The College of Education is a cornerstone of the university and offers numerous undergraduate and graduate-level programs designed to produce the next generation of educators (University of Central Missouri College of Education, 2023). Approaching 99% job placement, the University of Central Missouri greatly impacts the new service educators entering the workforce in the Midwest (University of Central Missouri College of Education, 2023).

Examining the structure of the organization will assist in understanding the different options available to prospective teachers and the effects on their experiences once working as educators. This section will describe the overall organizational structure and how the individual programs relate. From this, we will have the basis to examine the effects different programs have on the graduate's perception of preparedness as educators.

History of the Organization

The University of Central Missouri was originally established by an act of the General Assembly as the Second Normal School District in 1870 (Fast Facts, 2023). The university still resides in Warrensburg, Missouri, the site selected in 1871 as the location for the school. Its mission as outlined by the General Assembly was to, "influence the educational progress of the state and its work in producing qualified teachers and developing the type of educated citizenship that made Missouri a rich and prosperous commonwealth" (Fast Facts, 2023).

The university has gone through changes over the years which have been reflected by various name changes (Fast Facts, 2023):

- Normal School No. 2 (1871-1919)
- Central Missouri State Teachers College (1919-1946)
- Central Missouri State College (1946-1972)
- Central Missouri State University (1972-2006)
- University of Central Missouri (2006-present)

What started as a teaching college has expanded to four internal colleges: College of Arts, Humanities, and Social Sciences; College of Education; College of Health, Science, and Technology; and the Harmon College of Business and Professional Studies (University of Central Missouri Fact Book, 2021). Within these colleges, students can pursue undergraduate and graduate degrees along with certifications in various fields of study in over 150 academic programs (Fast Facts, 2023). All the university's programs are master accrediting organizations including the Council for the Accreditation of Educator Preparation (CAEP) (Fast Facts, 2023).

The University of Central Missouri has its main campus in Warrensburg, Missouri with a satellite campus in Lee's Summit, Missouri (Fast Facts, 2023). In addition to the two brick and mortar locations, many programs offer programs entirely online or through hybrid programs where some classes can be taken online while others require face-to-face instruction (Fast Facts, 2023). Even with all the changes since its inception, the percentage of degrees awarded to College of Education graduates accounts for approximately 18% of the total degrees earned at the University of Central Missouri for the years 2017-2021(University of Central Missouri Fact Book, 2021). Due to the large

number of graduates entering the teaching ranks in the Midwest from such a university, the training programs will have a major impact on education not just within the state but within the region and possibly a much larger context.

Organizational Structure

There are two organizational charts from the university’s webpage that explain the basic organizational structure.

Figure 1

University of Central Missouri Organizational Chart (2022)

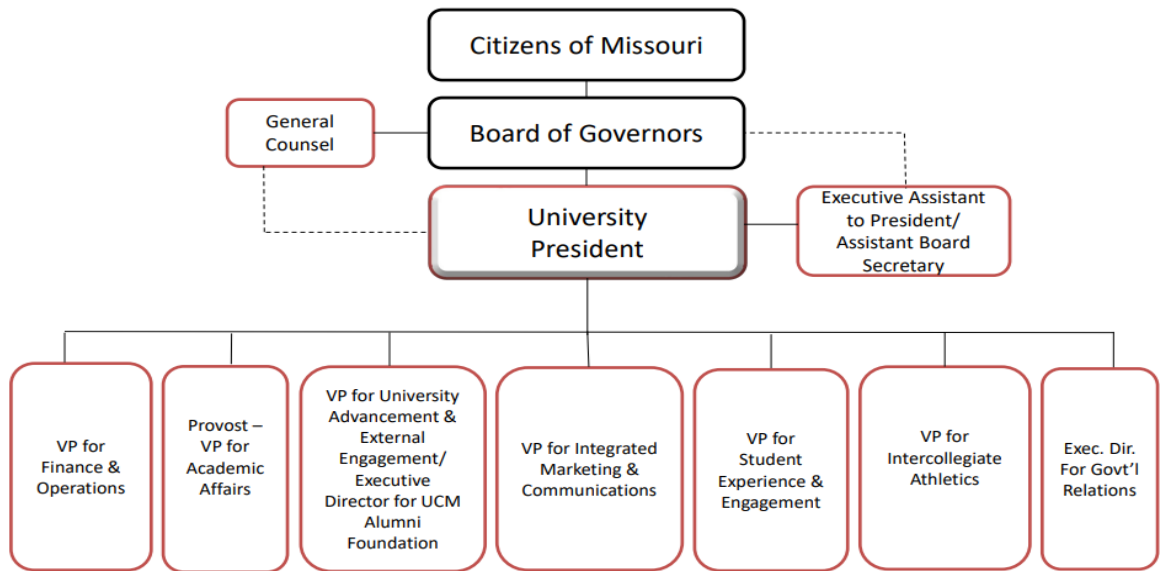


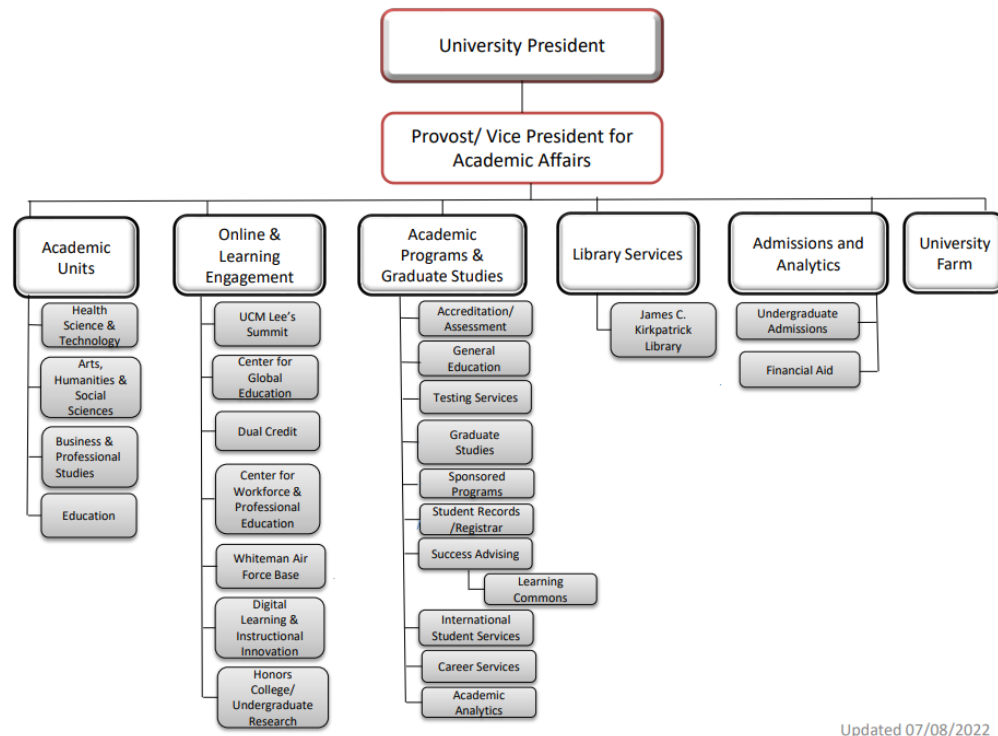
Figure 1 shows a straightforward connection to the public. As a public institution the citizens of Missouri have input through the Board of Governors that provides oversight to the University President and all aspects of the university. The president is then responsible for the overall management of the organization through Vice Presidents of specific managerial departments of the organization that, although they impact each other, are compartmentalized (University of Central Missouri Organizational Chart, 2022).

For this study, we will focus on the Provost/Vice President for Academic Affairs.

In Figure 2, it is notable that the Vice President for Academic Affairs oversees the aspects that control the academic focus, to include the Academic Units for Education (University of Central Missouri Organizational Chart, 2022).

Figure 2

University of Central Missouri Organizational Chart (2022)



College of Education

The College of Education is divided into several schools, each with its own department chair and then sometimes with coordinators separated by graduate or undergraduate studies. The departments within the college of education are (University of Central Missouri College of Education, 2023):

- Department of Career, Technical, and Special Education

- Department of Counseling and Educational Leadership
- Department of Early, Elementary, Middle and Physical Education
- Department of Educational Foundations and Literacy
- Department of Educational Technology and Library Science
- Grow Your Own Future with UCM Paraprofessionals Degree Pathways

Each department focuses on different specialties within education, although most degrees incorporate coursework from several departments.

There are many pathways within each of these departments to fulfill the requirements to pursue a teaching certificate. In addition to the traditional undergraduate programs to acquire initial teaching certification, UCM offers a Master of Arts in Teaching (Master of Arts in Teaching, 2023). This program is part of the Department of Educational Foundations and Literacy and focuses on the pedagogy of teaching for someone who already has a degree and experience in the subject content. It is a nontraditional option for an individual to acquire an initial teaching certification if they already have a college degree and earn a master's degree at the same time (Master of Arts in Teaching, 2023).

Leadership Analysis

The overall structure of the university allows for a cohesive functioning unit where each unit works to provide delineated responsibilities that converge at higher levels of leadership. According to Bolman and Deal (2013), every organization needs some form of vertical and lateral organizational structure. There are rules, policies, and structures in place to ensure cohesiveness between departments. This happens at the

university level and within the College of Education, as there are specific department chairs and advisors who act in autonomous units but must also work together.

The structure of delineation, along with a formalized plan to work cohesively, allows for flexibility to adjust at the base level without causing disruptions at the organizational level (Bolman & Deal, 2013). This is truly evident in the way that students must take courses from different schools within education to meet the overall requirements to achieve certification. The experts in each department can adjust to the best practices in each course without disrupting the whole degree program. At the same time, the certification office maintains lateral oversight to ensure that the requirements for certification are still being met (University of Central Missouri Organizational Chart, 2022). From a leadership perspective, it is a wonderful interplay of checks and balances through flexibility and accountability (Bolman & Deal, 2013).

Implications for Research

Bolman and Deal (2013) assert that there is no specific structure that works for all organizations and that each organization must develop its own, depending on the needs and desired outcomes of the organization. The structure at UCM lends itself to being responsive to change. It has been discussed that the ability to make changes at the instructional level without causing disturbances within other areas of the organization is a huge benefit to adaptability (Bolman & Deal, 2013). The lateral flow of information through the interworking of the departments also allows for best practices to benefit the whole organization. This is good news as the practitioner of the study is working to inform the traditional program and the MAT program about experiences and outcomes

that benefit teaching candidates. It is an opportunity for both programs to benefit from each other without causing major shifts within the organization.

Traditional Program

The traditional program is designed for students entering college after earning a high school diploma looking to pursue a degree in education. Students are required to meet a minimum of a 2.0 high school grade point average (GPA) and a minimum of a 21 ACT score or 1060-1080 on the SAT (University of Central Missouri Assured Admission Requirements, 2023). The requirements vary if a candidate has a higher GPA or does not have a qualifying test score. Applicants who do not meet recommended minimums for admission are encouraged to apply and their application will be assessed individually for admission through other entry programs (University of Central Missouri Assured Admission Requirements, 2023).

The pursuit of a Bachelor's of Science in Education (BSE) requires a student to complete a regimen of courses that include courses outside of their field of study (University of Central Missouri Catalog, 2023). As part of a BSE, there are numerous educational specific courses that each teacher candidate must take to earn a BSE (see Appendix A). The important features to notice from each of the course requirements are the number of hours specific to education and student teaching. Each degree program requires the traditional teaching candidate to complete over 40 semester hours of instruction aimed directly at education or child development (University of Central Missouri Catalog, 2023). In addition, traditional teacher candidates must complete 12 hours of student teaching requirements (see Appendix A).

MAT Program

The MAT Program is specifically designed for professionals who already have a bachelor's degree in a field other than education and are interested in becoming a certified teacher. Requirements for entry into the program include having earned a bachelor's degree from an accredited college or university and a minimum GPA of 2.5 (Master of Arts in Teaching, 2023). In addition, applicants must submit professional recommendations as well as a personal statement about why they would like to become a teacher. (University of Central Missouri Catalog, 2023). There are additional requirements for international students (Master of Arts in Teaching, 2023).

The required courses for an MAT teaching degree are comprised of graduate level coursework totaling 30 semester hours of instruction (University of Central Missouri Catalog, 2023). All courses are education based and pertain directly to the major of education. There are some slight variations in courses based upon the level of students who will be taught by the teaching candidate and the program major (see Appendix B). A look at the course names shows that even though they are slightly different in course number, they appear to have a similar focus by course name (see Appendix B). Student teaching or Internship is also required for each degree (University of Central Missouri Catalog, 2023).

The major program that appears to have the largest difference is Science Education (8006). The Science Education major has courses that are not easily recognizable as being comparable to the other programs, specifically in the areas of classroom management and child development (see Appendix B). These concepts may be

incorporated into the science specific courses, but it would require a deeper understanding of what is taught in each course.

Program Comparison

Most of the pedagogical content that is required in the traditional program appears to be incorporated into the MAT program. The overall number of semester hours is reduced but it is at a graduate level and may be condensed into a smaller time frame (University of Central Missouri Catalog, 2023). Two semesters of student teaching or internship is required in both the traditional and MAT programs (University of Central Missouri Catalog, 2023). Except for Science Education, it is apparent that the coursework of the MAT is aimed at offering a comparable experience in teacher preparation to that of a traditional teacher program (see Appendix B).

According to the UCM Factbook (2021), UCM awarded 226 BSE degrees in the 2016-2017 academic year and that number has declined to 184 and 180 for the years 2019 to 2021. Over the same years the STEM majors in Biology, Career and Technology, Secondary Education/Junior High Science and Mathematics declined from 15 degrees awarded to 2 and none in the most recent two years of data, however these numbers may have been incorporated into the general secondary degrees awarded (UCM Factbook, 2021). Current data shows a slight resurgence in the number of BSE degrees awarded for the 2021-2022 school year to 213 but then another decline in 2022-2023 to only 150 degrees awarded (UCM Factbook, 2023).

The MAT program has seen a relatively stable number of degrees awarded over the same period, fluctuating between a low of 34 and a high of 43 from 2016 to 2021 (UCM Factbook, 2021). A more recent look shows that the number of MAT degrees

awarded for the two years 2021-2022 and 2022-2023 has dropped even more to 25 and 20 graduates respectively (UCM Factbook, 2023). Going back to 2013, however, the number of MAT degrees awarded was as high as 77 and experienced a quick drop (see Appendix C). More recent data show that only 23 MAT degrees were awarded in the 2021-2022 academic year (see Appendix C). The number of degrees awarded may have been influenced by the COVID-19 pandemic of 2020 or may also support the idea of a teacher shortage due to a limited supply of new candidates.

Summary

The University of Central Missouri is a fully accredited and revered teacher preparation college in the Midwest. It offers undergraduate and graduate teacher preparation programs in numerous curricular areas (Fast Facts, 2023). Therefore, it has a large impact on education within the Midwest region, specifically Missouri.

As an organization, UCM has a layered and delineated structure that works together but independently by separating major functions under its own management structure with each vice president or executive director reporting directly to the president. This allows independent entities the flexibility to make timely decisions without disrupting other areas of operation (Bolman & Deal, 2013). It also ensures that all divisions support each other under one organizational leader. This allows for flexibility and provides a defined structure and a cohesive vision. This study informs the leadership within the College of Education to better advise teacher preparation programs.

The traditional teacher preparation program and the MAT program at UCM have similar attributes and some definite differences (University of Central Missouri Catalog, 2023). They both are initial teacher preparation programs to prepare teachers to enter the

classroom for the first time. They both require similar pedagogical experiences although the amount of semester hours and internship hours may vary (see Appendix A and Appendix B). It is interesting to note that both programs have seen a drop in degrees awarded over the years (see Appendix C).

SECTION III: SCHOLARLY REVIEW FOR THE STUDY

Introduction

The following review of the literature will detail the research into the factors that are affecting the shortage of teachers in STEM fields. Even though there are some who argue against a teacher shortage, most research does indicate a shortage based on subjects or location (Dee & Goldhaber, 2017; Cowan et al., 2016). In addition, some research suggests that the shortages have been part of the educational system for many decades, and reform has not addressed the problem (Sutcher, Darling-Hammond, & Carver-Thomas, 2019; U.S. Department of Education, 2016).

To understand the teacher shortage problem, it is also necessary to discuss the multiple factors that affect the number of teachers needed. These factors include the number of students, attrition, retention, retirement, and the preparation of new teachers looking to enter the workforce as educators (Sutcher, Darling-Hammond, & Carver-Thomas, 2019). These all can be affected by national, state, and local policies as well (Dee & Goldhaber, 2017).

In order to address shortages, many policies have been implemented aimed at putting more qualified teachers into the classroom. Further research describes an increase in the number of options for possible teacher candidates to enter the classroom (Bowling & Ball, 2018; Zhang & Zeller, 2016). The literature mostly focuses on three types of teacher certification programs: traditional, alternative, and “other”. Each type will be defined and analyzed to show the current trends in teacher preparation. The research shows a vast difference in the results of many of these programs and the experiences that teachers have in the classroom after leaving the various types of programs (Fenwick, 2022; Ingersoll, Merrill & May, 2012).

In addition, it is also necessary to examine why teachers enter the profession and which programs are being utilized and the effect that has on the candidate themselves and the students. Many argue that programs other than a traditional four-year teacher preparation program at a university do not produce the same quality of teacher candidates (Bowling & Ball, 2018; Zhang & Zeller, 2016). However, the research shows mixed results and shows promise for the benefits of different types of programs. Many, instead, point to specific components of the teacher preparation programs as being indicative of future success in the classroom (Pankowski & Walker, 2016; Salgado et al., 2018).

Research also suggests that many of the reasons individuals give for wanting to become teachers is the same regardless of program of entry into the profession (Alharbi, 2020; Howes & Goodman-Delahunty, 2015; Mobra & Hamlin, 2020). Even though there are many similarities in reasons to become a teacher, research also shows that career changers bring with them a different level of experience and expertise that may cause different struggles in adjusting to the classroom (Anderson, Fry & Hourcade, 2014; Vaidya & Thompson, 2020). This review of literature will examine the factors leading up to these differences.

Teacher Shortages

The classroom most people encountered in their formal education throughout the history of the United States has not changed dramatically over the last 100 years or more. According to Miller (2020), “children come to school around the age of five to enter kindergarten and then move through the current system by age and grade level. These children sit in rows, are addressed by the expert teacher, are given information, and are expected to memorize and regurgitate the material in a standardized testing process”

(p.1). School starts in August or September and remains in session until May or June when students are released for summer break. Although there have been major shifts in philosophy, most educational settings still follow this basic premise.

It is interesting to note that teacher shortages are not new. Behrstock-Sheratt (2016) described teacher shortages in the United States since the time of the Great Depression. Other sources describe shortages of teachers in math and science back to the 1960s (U.S. Department of Education, 2016). Sutchter et al. (2019) assert that shortages in teachers have not been handled effectively. This may be the case as shortages are still a much-debated topic in educational research and policy today.

Still, many researchers argue that there is not a shortage of teachers. There is data that suggests many individuals with teacher certifications are currently not working as teachers. If the number of individuals who hold certification were compared to the number of vacancies in education, then there is an excess of teachers in the market (Cowan et al., 2016). If this is the case, then perhaps it needs to be investigated as to why these teachers are not teaching.

The preponderance of evidence suggests that there is a teacher shortage. Some researchers argue that there is a teacher shortage across the board and internationally. New research suggests that the shortage is limited in scope, if not breadth. This research narrows the teacher shortage to specific subjects, localities, or types of school. Specifically, there is a shortage of math, science, and special education teachers. Much of the difficulty in finding teachers appears to be in urban or rural locations. This also tends to be regions where the majority of the population is low income or comprised of racial minorities (Dee & Goldhaber, 2017; Larios, Zetlin & Ricci, 2022; Zhang & Zeller, 2016).

This is especially concerning as it comes at a time where STEM education is at a premium. It also lends to the growing and persistent racial and economic divide as students from low income or minority families may not have access to the same level of education. Sutcher et al. (2019) point out that there is a historical pattern where students in schools that are considered high poverty and high minority are most likely to be taught by underprepared, inexperienced, and out-of-field teachers and, thereby, suffer the most from teacher shortages.

Unfortunately, the future does not look promising regarding the teacher shortage problems that exist. There are several factors that are compounding the teacher shortage issue. From a supply and demand perspective, for every defined number of students there must be an educator. For example, the student to teacher ratio is nationally hovering around 16 to 1. The number of students to staff is a critical component and can be altered based upon local regulations and policies but, at some point, it is conceivable that as the number of students goes up, the number of teachers needed will also rise (Sutcher et al. 2019). Based on that argument the need for more educators is rising as is the number of school-aged persons in the U.S.

Secondly, the average age and number of years worked for the teaching force is increasing. This means the percentage of teachers nearing the end of their careers is increasing, suggesting retirement will have a more significant impact on teacher numbers.

Third, many teachers are leaving the profession, especially in math, science, and special education (Haj-Broussard et al., 2016; Ingersoll, Merrill & May, 2012; Zhang & Zeller, 2016). Teacher retention and attrition becomes an ever more important discussion during a shortage. If teachers do not stay in the profession, it creates higher turnover and

a smaller overall work force. Zhang and Zeller (2016) argue that teacher turnover causes significant costs to education replacing experienced teachers with novices. Zhang and Zeller (2016) further argue that this turnover creates an environment where students are continuously being taught by a stream of inexperienced teachers.

Fourth, the number of teaching candidates enrolling in any type of teacher training program is declining. According to Sutchter et al. (2019), between 2009 and 2014 the enrollment in teacher preparation programs dropped by 35%, and 23% fewer completed the program. Based upon the need and the lack of teaching candidates entering the pipeline, Sutchter et al. (2019) estimated a shortage would exist of 64,000 teachers in 2015 and 112,000 teachers in 2017-18. Based on the state teacher reports for 2017, 109,000 teachers were not teaching in their area of certification, which is indicative of a shortage of that many teachers, nearing the estimated number of vacancies predicted by Sutchter et al. (2019).

Contributing Factors

While there are many factors that play an impactful role in the teacher shortage, it would be reasonable to believe that there is not one sole cause or solution to the problem (Dee & Goldhaber, 2017; Zhang & Zeller, 2016). There have been attempts to address the situation, along with policies and practices that may have worsened the teacher shortage problem (Sutchter et al., 2019). The following are some explanations of the situation based upon the available research.

Not much can be done about the aging workforce reaching retirement and deciding to end their career. They should be congratulated for persevering in a challenging but rewarding endeavor (Podolsky et al., 2016; Sharma, 2012). Still, many

states have allowed retired teachers to come back out of retirement, or to work past retirement, especially in areas of need (Darling-Hammond et al., 2016). This merely delays the inevitable when a large portion of teachers will eventually leave the profession for good.

Attrition is a very costly problem associated with new teachers and it emphasizes the importance of retention through preparation and support. Zhang and Zeller (2016) attribute attrition to the level of education and the quality of the teacher preparation that candidates receive. Haj-Broussard et al. (2016) point out that the annual attrition rate among math, science, and special education is the highest among subjects at around 20 percent. Ingersoll et al. (2012) also reported more specifically that first year math and science teachers left teaching at higher rates than other new teachers. Sutchter et al. (2019) suggest that just by reducing attrition by 50% the teacher supply on a national scale would be sufficient.

So why are teachers leaving? Many teachers in their first-year report problems with classroom management, lack of support, working conditions, and even reductions in force as reasons for leaving the profession (Haj-Broussard, 2016; Newton et al., 2020; Zhang & Zeller, 2016). Other concerns noted by new teachers were student apathy, time management, and poor leadership. One teacher stated, “Inside the classroom, the biggest issue I face is getting students to care about learning the content. Teaching the content is easy; learning how to handle students that lack intrinsic motivation - that is the hard part” (Vaidya & Thompson, 2020, p. 111).

Another issue that plays an important role is that of the local market along with state regulations. Each state is responsible for determining the qualifications necessary

for certification. This means that at a minimum there are 50 separate and, possibly, quite different sets of requirements regarding teacher certification in the U.S. (Sutcher et al., 2019).

State licensure acts as a gateway to individuals entering the workforce as educators, but it can also act as a barrier. Due to the differences between states, teachers are restricted when moving to another state as certifications may not transfer (Dee & Goldhaber, 2017). It could require money, additional coursework, and time, which may lead some to not pursue a teaching position after a move. Restrictions on moving teacher retirement funds or loss of seniority and tenure may limit the ability or desire of teachers to change labor markets between states. When restricted to a specific region, even the school or district environments may cause individuals to choose one over another and create a void locally between districts or even between schools (Dee & Goldhaber, 2017; Sutcher et al., 2019).

Why Teach

So why do people become teachers to begin with? Interestingly, the reasons people decide to enter the education field are very similar regardless of the path they take to enter the classroom. There are two distinct categories motivating them to become teachers. The first is their intrinsic self-fulfilling desire to teach and the second is the external material benefits of the profession (Alharbi, 2020; Bauer et al., 2017; Howes & Goodman-Delahunty, 2015; Newton et al., 2020).

Intrinsically, most teachers have a strong desire to share what they know and a desire to give back to society. Alharbi (2020) states that the desire to share one's knowledge is often a result of personal experience during school or before it. This

intrinsic motivation is the good feeling that teachers get by working in a meaningful profession. Howes and Goodman-Delahunty (2015) noted that personal fulfillment took priority over most other factors when individuals were thinking of entering the teaching profession or deciding to stay in the profession.

Extrinsically, there are some actual and perceived benefits to a career in education. Many people see the profession as being stable. There will always be a need for educators and the public sector tends to be reliable with good benefits. Education is generally seen as compatible with a family as families with school aged children will be on a similar daily schedule and holiday or break schedule (Alharbi, 2020; Bauer et al., 2017; Mobra & Hamlin, 2020). Interestingly, one of the main complaints of teachers who leave the profession is that it is not compatible with a family due to the time commitment that teachers must make to complete the expectations of the job (Howes & Goodman-Delahunty, 2015).

Career Changers

Alharbi (2020) states, “In a modern economic environment, the idea of changing professions—so-called ‘professional transformation’—is inevitable. It is simply a feature of the times. And it is just as common among teachers as it is elsewhere” (p.90).

Yet, most teachers enter the profession through a traditional teacher preparation program where many of the teacher candidates graduate high school and go to college for four years, culminating in the opportunity to seek certification (Fenwick, 2022; Salgado et al., 2018). These early to mid-20-year-olds then enter the workforce as fully certified teachers. The initial time and commitment they make to teaching as a career choice may be indicative of their intrinsic motivation to teach (Mobra, 2020). Even with a strong

desire to become a teacher, many leave the profession within the first few years, especially in STEM related fields (Ingersoll et al., 2012; Zhang & Zeller, 2016).

Individuals who enter the education field to become teachers after first earning a degree and working in another profession are called career changers. Career changers have the same intrinsic and extrinsic motivating factors as any other teacher entering the profession (Alharbi, 2020; Bauer et al., 2017; Newton et al., 2020; Vaidya & Thompson, 2020). They experience similar frustrations once becoming a classroom teacher and report that classroom management, lack of support, and unrealistic demands cause them to leave the profession (Howes & Goodman-Delahunty, 2015; Vaidya & Thompson, 2020). What makes them different?

Career changers bring some positive attributes to the table. First of all, they have experience in the real world beyond college that many straight-out-of-college teachers may not have. Bauer et al. (2017) suggest that mature age professionals in engineering, technical, and science fields are a valuable resource to recruit. The experiences these professionals have are perceived to make them better able to explain concepts and make connections between the concepts taught in school and the real-world application (Alharbi, 2020; Anderson et al., 2014; Vaidya & Thompson, 2020).

Secondly, many of them are older and, just through life experience such as managing projects or raising a family, they have life experience that may help them manage the classroom differently (Alharbi, 2020; Anderson et al., 2014; Vaidya & Thompson, 2020). Both reasons make career changers appealing to schools and teacher preparation programs trying to recruit teaching candidates.

As noted previously, this does not make them immune to the challenges in the classroom. In fact, career changers bring with them a different set of issues due to their experience. Many have a hard time adjusting to the school culture. Alharbi (2020) notes that career changers do not simply rely on their expectations of teaching but compare them to previous careers. Teaching was seen as a step backwards by some, as they were not given consideration for their experience or previous background (Vaidya, 2020). Still, Anderson (2014) believes that career changers offer exceptional promise due to their content expertise, professional experience, and maturity, even though they will face new challenges.

Becoming a Teacher

Depending on the type of teacher preparation program, there are varied requirements for teachers to enter the classroom. There are three paths to initial certification (Dee & Goldhaber, 2017; Bowling & Ball, 2018). The first is the traditional pathway that was mentioned earlier and will be described in further detail. Second, an alternative pathway that usually starts with a candidate who already possesses a bachelor's degree in another field wishing to transition to teaching is called a career changer (Zhang & Zeller, 2016). Finally, there are emergency or temporary certifications that can be issued in the case of severe shortages that impact immediate functioning of the education system (Larios et al., 2022; Mobra & Hamlin, 2020). The type of program a candidate chooses depends on several factors, but each path satisfies the same need in a different way: the need for more teachers. In California, the need for teachers is so great that the number of emergency and temporary permits quintupled in four years' time (Sutcher et al., 2019). Generally, emergency or temporary permits are a stop gap that

does not lead to permanent certification and will not solve the teacher shortage issue, so the discussion will focus on traditional and alternative certification.

Alternative Certification

Alternative certification (AC) programs have the potential to help alleviate the teacher shortage and quality issues along with increasing diversity and retention (Koehler et al., 2013; Scribner & Heinen, 2009). Policy makers and government officials have recognized the potential of AC programs and have created programs such as Troops to Teachers and Transition to Teaching grants to expand AC programs and attract professionals from business and industry, including military veterans, to begin a teaching career (Harvey & Gimbert, 2007; Lee & Lamport, 2011).

Fenwick (2022) reports that only 70% of teacher preparation programs are traditional university based while 30% are alternative pathways. Of that 30%, 10% are not associated with any institution of higher education (Fenwick, 2022). New York City, for example, has created its own AC program called Teaching Fellows to address the teacher shortages, especially in low-performing and high needs schools (O'Connor et al., 2011). Yin and Partelow (2020) state that these AC type programs developed by schools, districts, and regional education providers make up the largest part of programs not associated with an institution of higher education and exist in 32 states.

Many colleges and universities have responded to the economic, educational, and political calls to increase the number of certified teachers by creating numerous pathways to certification, often circumventing traditional program requirements (Fenwick, 2022; Harvey & Gimbert, 2007; Kaplan, 2012). Traditional master's programs in education were meant to provide in-depth theory and knowledge for those already certified to teach

(Selke, 2001). The new AC programs, including those where graduates earn a master's degree, allow career changers who have content knowledge and professional experience the opportunity to gain their initial certification faster, saving time and money, oftentimes allowing them to teach while they are completing the requirements for certification (Fenwick, 2022; Larios et al., 2022; Lee & Lamport, 2011; Ng & Peter, 2010; Scribner & Heinen, 2009; Zhang & Zeller, 2016).

Since the number of AC programs and the number of teachers entering the profession through AC has increased, the question about the quality of teachers receiving certification by alternative means has become a dividing factor among researchers (Bowling & Ball, 2018; Fenwick, 2022). Evans (2010) suggested that the argument over which program type, traditional or AC, produces the best results is unresolved in the research. Moffett and Davis (2014) stated that the research comparing the quality of traditional versus AC programs is not new, but instead acknowledges that both forms of teacher preparation may be producing questionable results. Bowling and Ball (2018) still affirm that alternatively certified teachers are viewed as being less prepared or inconsistently prepared at best.

Alternative Certification compared to Traditional Programs

AC programs differ greatly concerning the requirements needed to enter an AC program, the number of hours necessary, and the amount or extent of supervised internship candidates must complete to attain an initial teaching certification (Chait & McLaughlin, 2009; Dee & Goldhaber, 2017; Ng & Peter, 2010; Stanley & Martin, 2009). Moffett and Davis (2014) argued that traditional programs have the greatest requirements for teachers and AC programs are a way to circumvent a traditional four-year

undergraduate degree. Fenwick (2022) agrees that most alternative certification providers use loopholes to skirt rigorous standards. Moffett and Davis (2014) recognize that most AC programs require a bachelor's degree for admittance but contend that it does not have to be in education.

Hung and Smith (2012) also noted that some challenges MAT graduates had while teaching may be related to the fact that their degree did not match the subject they would be teaching. However, Lee and Lamport (2011) found that over half of non-traditionally certified teachers reported that prior work experiences that may appear to have had no direct content value proved useful in their new teaching position.

More recent research has started to investigate how previous professional experiences relate to the classroom environment. Vaidya and Thompson (2020) describe that approximately half of the teachers they interviewed made the adjustment to teaching by drawing on prior experiences. Alharbi (2020) points out that career change teachers not only benefit from the application and content knowledge but from other soft skills like managing people or stressful situations. Anderson (2014) contradicts this view and instead reports that one subject stated that their early career did little to prepare them for the classroom. They further state that industry experience was so different that a new skill set must be learned for the classroom.

Another major difference between traditional and AC programs is the amount and type of mentoring, internship, or supervised teaching experience a candidate must complete (Bowling & Ball, 2018; Dee & Goldhaber, 2017; Sutchter et al., 2019). The amount, quality, and length of mentoring and internship vary widely (Chait & McLaughlin, 2009; O'Connor et al., 2011; Salgado et al., 2018; Scribner & Heinen, 2009;

Stanley & Martin, 2009). Compared to the extensive student teaching experience of a traditional program, many AC programs allow the teaching candidate to work full time as a paid teacher while completing certification requirements (Boe et al., 2007; Fenwick, 2022; Larios et al., 2022; Zhang & Zeller, 2016).

Due to the extreme variation in AC programs, there has been much debate over the quality of teachers entering the workforce through non-traditional pathways (Moffett & Davis, 2014). Robertson and Singleton (2010) shared a sentiment of AC critics and suggested, “assigning students to teachers who entered through shortened preparation programs was as inconceivable as entrusting them to the care of a doctor who had 6 months of intensive course work and a mentor in the next room” (p. 216). Some believe that AC programs undermine teaching as a profession and the overall perception is that AC trained teachers are not as highly qualified as traditionally trained candidates (Bowling & Ball, 2018; Moffett & Davis, 2014; Robertson & Singleton, 2010).

A main focal point in the debate is the focus on content over pedagogy. Salgado et al. (2018) assert that alternative certification programs do not provide as much training on instructional methods and pedagogy as traditional programs. This lack of pedagogy training occurs on the job as teachers are already teaching in the classroom and leads to higher rates of attrition (Ingersoll et al., 2012; Zhang & Zeller, 2016). Pankowski and Walker (2016) promote a teacher preparation program involving the simulation of classroom situations, as it connects knowledge to action. Without rich pedagogical teaching experiences, alternative certification can be viewed as a sink or swim approach when it comes to non-content preparation (Zhang & Zeller, 2016). Rotherham and

Willingham (2009) argued that being a subject matter expert does not automatically and instantly make someone a great teacher.

Teacher Perceptions

Research on teachers from AC and traditional teacher preparation programs identified numerous similarities among new teachers. The most daunting concern is that many new teachers from traditional and AC programs often leave the teaching profession within the first few years, which compounds the teacher shortage problem (Gifford et al., 2013; Koehler et al., 2013). Math, science, and special education are of the most concern as attrition rates is as high as 20 percent (Haj-Broussard et al., 2016; Zhang & Zeller, 2016).

Several common concerns teachers have identified throughout numerous studies are classroom management, low student motivation, lack of parent or administrative support, and the inability to apply the theory learned in coursework to the classroom (Hung & Smith, 2012; Koehler et al., 2013; O'Connor et al., 2011; Rotherham & Willingham, 2009; Vaidya & Thompson, 2020). Gifford et al. (2013) related classroom management to a storm. Teacher candidates in their coursework can talk about how they would prepare and consider the actions they would need to take, but in the classroom when the wind blows and the lightning cracks, the need to act is immediate. New teachers are not practiced in applying the management tools discussed in coursework in real time (Gifford et al., 2013).

AC certification programs have shown some differences from traditional programs. However, due to the variation in AC programs, examining data across programs is problematic (Bowling & Ball, 2018; Fenwick, 2022; Scribner & Heinen,

2009). Several studies over time have shown that AC programs attract more ethnically diverse individuals into the teaching field (Harvey & Gimbert, 2007; Kirby et al., 1989; Lee & Lamport, 2011; Yin & Partelow, 2020). The increase in diversity among teaching candidates in AC programs may provide a more equitable fit in the classroom, as many AC teachers are utilized in low-income urban areas with disproportionately high minority populations (Fenwick, 2022; Ng & Peter, 2009; Zhang & Zeller, 2016). One study by Haj-Broussard et al. (2016) argues against this idea, stating that alternatively certified teachers teach in a wide variety of settings.

AC certified teachers also noted some benefits they perceived due to their prior professional and life experience (Alharbi, 2020; Vaidya & Thompson, 2020). Many AC certified teachers believed that they had advanced content knowledge compared to traditionally trained teachers, especially if their previous work or degree was related to their subject area (Hung & Smith, 2012). Sappa et al. (2015) have shown positive results of second careers for current teachers, not just previous careers. They contend that the experience and continued application outside of the classroom translates directly to a more positive classroom experience.

Even more dramatic was the perceived benefit of general work experience and life experience even if it was not directly related to education or the subject being taught (Alharbi, 2020; Ng & Peter, 2009). Robertson and Singleton (2010) noted that although traditional teachers could receive more pedagogical training, they lacked the real-life practical experience that AC teachers have entering the program. Anderson et al. (2014) suggest that career changers do have promise due to content expertise, professional

experience, and maturity; however, this may pose new challenges in adjusting to teaching.

Recommendations for Alternative Certification

The variation of AC programs makes comparing and analyzing AC programs as a group troublesome and many studies are showing mixed results (Boone et al., 2011; Bowling and Ball, 2018; Fenwick, 2022; Scribner & Heinen, 2009). Kaplan (2012) explains that Teach for America, due to its prominence in AC, has become the catalyst and example when confronting the many concerns about AC programs.

Amid the debate, proponents of AC programs are still touting AC as a means to alleviate the teacher shortage although most are suggesting targeting areas of concern and better regulation (Dee & Goldhaber, 2017; Fenwick, 2020). Opponents of AC argue that many of the quick licensure programs are producing inferior teachers who lack the pedagogical training necessary to be effective and are a short-term solution to a long-term problem (Bowling & Ball, 2018; Heilig & Jez, 2010; Rotherham & Willingham, 2009; Zhang & Zeller, 2016).

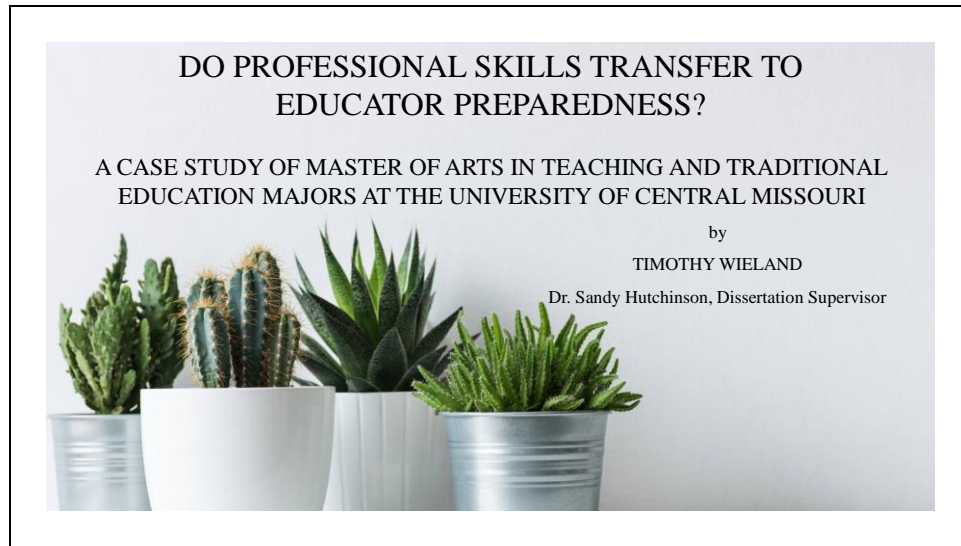
In addition to structural and policy changes, it is evident through the research that changes can be made to the current AC programs to alleviate some of the concerns with both AC and traditionally prepared teachers. First, providing mentoring opportunities or rich simulation style preparation may help with classroom management and administrative concerns (Pankowski & Walker, 2016). Secondly, the expectations in workload or means to deal with time management and selfcare need to be stressed (Larios et al., 2022; Vaidya & Thompson, 2020). Finally, teachers need to be recognized for what

they bring to the table, financially and otherwise (Alharbi, 2020; Anderson et al., 2014; Howes & Goodman-Delahunty, 2015).

Summary

AC programs are needed to meet the current and projected demand for new educators (Sutcher et al., 2019). AC programs vary greatly in focus and design, often producing mixed results (Bowling & Ball, 2018). The variations make studying AC programs difficult, but the teachers graduating from AC programs are having the same difficulties as those from traditional programs. Beyond the troubles associated with new teachers, AC teachers report some benefits in having prior work and life experience (Alharbi, 2020). These graduates offer something that may be missing in traditional teacher preparation programs. Kaplan (2012) urged policymakers to realize that AC teachers should not be treated as a separate pool of teaching candidates, but rather contributors to the overall development of the teaching profession. Studying how prior work and life experiences translate directly into the classroom environment is crucial to learning experiential aspects that may inform alternative and traditional preparation programs. Through these newly identified practices, tacit knowledge, that can only be gained through application, may be advanced.

SECTION IV: CONTRIBUTION TO PRACTICE



Good morning/afternoon! Thank you for joining me for this scholarly paper presentation. Today I would like to share with you “DO PROFESSIONAL SKILLS TRANSFER TO EDUCATOR PREPAREDNESS?” I hope you find this presentation informative, and I look forward to your feedback and suggestions for improvement.

The motivation for this research was born out of my own experience as a teacher graduate of the MAT program at UCM. I entered the classroom following several career paths after earning my initial degree in mechanical engineering. I felt that UCM adequately prepared me for the classroom, but much of my success was also owed to my experiences outside of the formal teacher preparation program. As the need for quality teachers, especially in STEM related fields, is increasing, I felt it necessary to look at what attributes we should be looking for and cultivating in incoming teachers to help them be successful.

Statement of the Problem



The problem facing education is a current and projected shortage in the number of STEM educators

- The research indicates teacher shortages
- Minimally there are content area and or regional shortages
- Some research suggests that teacher shortages are a traditional and systemic problem that has not been properly addressed (Sutcher et al., 2019)

Most of the research indicates that there is a teacher shortage. Even research that argues against widespread shortages usually concedes that there are regional or content area shortages among teachers. One such area is STEM-related fields, where there is a projected shortage of available teachers. Sutcher and others argue that this problem has been a systemic and ongoing issue in education.

Purpose of the Study

The purpose of this study is to gain an understanding of the experiences of STEM teachers who have completed the Master of Arts in Teaching (MAT) program at the University of Central Missouri (UCM) compared to those completing a traditional teaching preparation program.



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Research Questions



1. What curricular or professional experiences do teachers consider to be critical to their success as a teacher?
2. How do graduates of the MAT and traditional programs perceive their preparedness to teach?
3. How do graduates of the MAT with prior work experience and traditional program graduates perceive their comfort in classroom management, content, and pedagogy?

The following Research Questions were used to guide this study:

- What curricular or professional experiences do teachers consider to be critical to their success as a teacher?
- How do graduates of the MAT and traditional programs perceive their preparedness to teach?
- How do graduates of the MAT with prior work experience and traditional program graduates perceive their comfort in classroom management, content, and pedagogy?

Methodology

- Qualitative case study
 - Variables not controlled (Creswell, 2014)
 - Focus on personal experiences
 - Focus on meaning and understanding (Merriam & Tisdell, 2016)



The methodology behind this study lent itself to a qualitative case study as I was focused on understanding the meaning of the participants' experiences. There were parameters for this study but in the strict sense of experimental design, variables were not manipulated and controlled. Instead, common threads were discovered through interaction and rich context woven into their personal stories.

DESIGN OF THE STUDY



- Interviewed ten teachers that completed the traditional teacher preparation program and seven teachers that completed the MAT program at UCM with a certification in a STEM field
- Purposeful sampling was used to contact past graduates
- Participation was voluntary and limited to the first ten respondents from each group

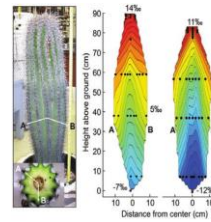
The design of the study was to interview 10 teachers from each of the two programs at the University of Central Missouri that lead to earning initial teacher certification. The traditional teacher preparation program and the Master of Arts in Teaching program. To limit the participants of the study to those parameters purposeful sampling was done to contact graduates of those two programs directly. The certification office and the MAT program coordinator were contacted to provide contact information from which a call to participate was sent out en masse. Participation was voluntary and responses were limited to a maximum of 10. Unfortunately, after several attempts to contact MAT teachers, only 7 willing participants were located for this study.

Study Participants					
Name	Program	Years	Subjects Teaching	Previous Occupation	Grade Level
Sara	BS	2	Biology, Chemistry		9-12
Steven	BS		Coaching		College
Sam	BS	8	Physical Science, Chemistry		9-12
Sally	BS	8	Science, STEM		6-8
Stewart	BS	5	Life Science, Physical Science, Integrated Science		
Stacy	BS	5	5 th Grade Science, Math, Geometry, Alg. 2, Trig., Statistics, Pre-Algebra, Geometry, Applied Geometry		5, 8, 9-12
Shirley	BS	7	Math, Algebra		6-8
Scott	BS	6	Math, Leadership		5-8
Susan	BS	5	Geometry, Integrated Math, Trigonometry, College Algebra, Calculus		9-12
Sheila	BS	6	Science, History		6-7
Jennifer	MAT	7	Chemistry, Drums, Theoretical Chemistry, College Prep	NA	10-12
Joan	MAT	2	Math, Project Lead the Way, Physical Science	Business Marketing	6-7
Julie	MAT	3	Agriculture	Ag Industry	9-12
Jessica	MAT	11	PE, Art, Math, Science, Current Events, MS Reading	Law Enforcement	K-2, 6, 9-12
James	MAT	5	Algebra 2, Geometry, Pre-Calculus, Geometry in Construction	Engineering	9-12
Jane	MAT	4	Project Lead the Way	Healthcare	7-8
Joy	MAT	17	Business, Finance, Personal Finance, Elementary Sped	Corporate Sales	K-4 7-12

Here you can see a list of the participants that responded to the survey and were interviewed as part of the study. Traditional program participants were given aliases starting with the letter S. MAT participants were given aliases starting with a J to give a connection to the degree program completed throughout the presentation. This slide shows their alias, degree program, number of years teaching, subject areas and grade levels in which they have taught, along with previous occupation for MAT graduates. Interesting to note is the large number of courses and grade levels for some educators. (See Susan, Stacy, James, Jessica)

Data Analysis

- Recorded interviews were transcribed and analyzed
- Categories were developed based upon the content of responses
- Themes were developed from common responses and categorized amongst the participant responses
- Process of open coding then narrowing using axial coding outlined by Merriam and Tisdell (2016)
- Results were compared to other studies to increase the possibility of generalizing the results (Creswell, 2014; Merriam & Tisdell, 2016)



Interviews were recorded and transcribed. The transcriptions were then analyzed for content. Common themes emerged from the responses and categories were developed. Relationships between categories were also formed to make cross-categorical connections as outlined by Merriam and Tisdell. Results were also compared to the research to strengthen reliability.

University of Central Missouri (UCM). Longstanding teacher preparation college that has expanded to over 150-degree programs since its inception in 1871.

Traditional program. An undergraduate program designed for students that have graduated high school and are seeking to earn an initial teaching certificate to become a teacher.

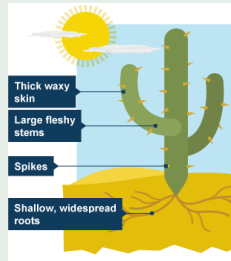
MAT Program. A graduate program for professionals that already have an undergraduate degree in a field other than education, to earn an initial teaching certificate to become a teacher.

Programs at UCM



The University of Central Missouri began its existence as a teacher's college in 1871. It has since expanded to over 150-degree programs. The two programs that are the focus of this study are the traditional teacher preparation program and the MAT program. The traditional teacher preparation program is aimed at students coming directly out of high school and wishing to earn an initial teaching degree and certification. The MAT program is for individuals that currently have a bachelor's degree in another field and wish to earn a degree in education as well as become certified to teach.

Review of the Literature




- Teacher shortages especially STEM and Special Education (Dee & Goldhaber, 2017)
- Expansion of Alternative Certification with varying success (Bowling & Ball, 2018)
- Varying requirements to become certified (Dee & Goldhaber, 2017)
- Common problems experienced by most new teachers (Howes & Goodman-Delahunty, 2015)
- Research focuses on curricular components but limited focus on professional experiences and transferability (Alharbi, 2020; Anderson et al., 2014)

While reviewing the literature on education and programs aimed at earning certification, some very important aspects in the field of education and preparation became apparent. First, there is a shortage of teachers, especially in STEM related fields and Special Education. Second, the avenues for individuals to seek initial certification have expanded greatly. As a result of the proliferation of different programs aimed at earning initial certification, the requirements for each program are varied as well. Interestingly, the challenges that new teachers face seem to be similar, regardless of what type of program from which they earned certification. Several researchers have pointed to the idea that the research surrounding these new teachers and programs is focused on the curricular components without regard for the professional experiences or other skills that may impact their success in the profession.

Theoretical Framework

- Arguably, certain aspects of teacher certification programs produce qualified teachers (Alharbi, 2020, Pankowski & Walker, 2016; Zhang & Zeller, 2016)
- The expectation is that skills learned will be transferable to the classroom
- Transferability as the “application of skills or knowledge learned in one context to another.” (Macaulay, 2016)



This study aimed to build on that research gap that Alharbi, Anderson and others have identified. The theory behind this research is that skills can be learned and transferred to a different venue or application. This is the whole basis of education, and our teacher preparation programs are designed to provide skills and knowledge that produce qualified teachers who can then perform in the classroom. The whole idea of transferability is the application of skills or knowledge learned in one context to another.

TRANSFER OF LEARNING



- Basis for traditional learning, applying skills learned in theory or another application
- Limited research shows conflicting reports (Alharbi, 2020, Vaidya & Thompson, 2020)
- Improvement in one area has positive effects on another (Woodworth & Thorndike, 1901)
- Day and Goldstone (2012) contend that the transfer of learning is indirect and can be affected by many factors

Transferability or Transfer of learning is the cornerstone of education. However, the research shows conflicting reports on the actual effectiveness of transferring from one application to another. Traditional research states that improvement in one area will affect another. Day and Goldstone contend that this transfer of learning can be influenced by any number of things and may not be as straight forward as traditionally thought, which is what may have led to the conflicting reports noted above.

Research Q1: Findings

What curricular or professional experiences do teachers consider to be critical to their success as a teacher?

- Similar findings for MAT and Traditional teachers
- Curricular courses aimed at teaching; application based were preferred
- Student Teaching and Observations
- Technical work experience was helpful
- Family and or life experiences: Parenting, siblings, personal experiences
- Maturity helps

As we go through the next set of slides where we examine the research questions and look at the data that was collected pertaining to each, we will first review the question and the main points. Then we will delve deeper into each specific finding and show supporting statements made by the participants so you can gain a deeper understanding from their point of view. Let us begin with research question one: What curricular or professional experiences do teachers consider to be critical to their success as a teacher? The main findings for this question were that the experiences of MAT and traditional teachers were similar for most of them. They preferred courses that were focused on teaching the content and were application based. Overall, student teaching and observations were considered invaluable. Technical work experience was beneficial to support content. Family and life experiences helped make them relatable as new teachers. Finally, maturity was a plus, according to the teachers surveyed.

Courses that were application based and directed at teachers were the most beneficial

“I don't remember the specific name, but they were math teacher-focused, so we were only math teachers in there. I think there was a middle and high school levels...That is what I really felt prepared me for the classroom.” -Susan

“They all focused around the same thing...One of the classes was the one with the lesson planning. I think that one was called instructional strategies for middle school mathematics...” -Joan

“I think that if I were to go back and change one thing, it would have been to have more of those science classes that were education based rather than general science.” - Sally

14

Each slide or slides, if more than one per topic, has a mix of responses from traditional teachers and MAT teachers. Here you can see three quotes transcribed from the interviews. These respondents, along with others, alluded to the fact that there were content courses to understand, and then there were content courses where they were learning how to teach that content. Participants reported that those courses that not only taught the content but focused on how to teach the content were very beneficial in preparing them to teach. In addition to content related courses, courses that focused on lesson planning and instructional strategies were also a common link between teachers, as expressed here by Joan.

Student Teaching and Observations

"...student teaching experience helped me the most...actually in the classroom that last semester, that's when I was like, okay, this is not so bad."

–Sara

"The student teaching was like having your boots on the ground. Being in the classroom definitely helped...But where we actually got experience in a real classroom helped more than anything else did..." –Sam

"I think as much shadowing or observation that you can do the better." –James

"I wish that I would have done a more varied teacher observation" –Jessica

"Honestly, I think I would have figured out a way to go in and do more observations." – Stacy

15

Student teaching and observations were a positive and common theme among respondents. Most participants expressed a desire to expand opportunities in these areas to include more diversity, frequency, and to start them earlier. Sam summed it up, *"where we actually got experience in a real classroom helped more than anything else did..."*

Technical Skills Transferred

"I got a bachelor's degree in civil engineering. I worked in the industry for eight years as an engineer and a project manager...there's a huge relationship between managing a crew of adult men and women and a classroom. Even though it might not sound like it, but my project management role was overseeing and managing, personalities, people, and relationships between us and the client...effectively leading meetings, being able to, be a leader, but also letting people speak and listen. And so that directly relates to teaching. I'm able to bring those skills into the classroom. I know how to best equip kids to work together, work with me, and hopefully those leadership skills I brought translate to the classroom." -James

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Do professional skills help? According to James, the transferability of skills from his professional career before education helped him manage and lead within his classroom. Julie, in her interview, spoke about how they were able to use their experience in the agricultural industry of training farmers and applying similar techniques and examples within the classroom. Jessica discussed how being a law enforcement officer helped her work with troubled youth. Overall, technical expertise was looked at favorably by respondents. Since MAT teachers had professional technical experience before entering the classroom, responses relating that experience to positive outcomes in the classroom were limited to MAT respondents.

Life is the Best Teacher

“Now as a teacher, being a parent first I think has been incredibly helpful.” –Jane

“I went into the classroom as a mom, so I had a little bit of a mindset of how would I want my teacher or my daughter's teacher to treat her? So, I felt like that helped me guide how I taught my classroom and how I handled things.” -Shirley

“Then being dyslexic, I can read fine, but I switch and mirror image things a lot. So, like in Kansas City, where I grew up my whole life, there is 435 highway and I'm always looking for 534 highway and never remember that I flipped the number of myself...Like when I would catch a kid doing something like that, I'd be like, oh, I do that too and this is how I learn to do it.”- Sheila

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And with most things, life is the best teacher. Education tries to teach you before you take the test, life gives you the test and then you learn from it! Teachers from the traditional program and the MAT who were parents attested that being a parent helped them deal with situations in the classroom. Whether it was from the experience of dealing with kids or the perspective of how I would like my children to be treated, it gave them the perspective that they could apply situationally in the classroom. Sheila addressed a different situation in that she struggled with dyslexia and through that gained not just understanding but a connection that allowed her to explain things differently to students. I am sure more respondents can empathize with students given their life experiences. Another spoke about how they are a member of the LGBTQ community and the rough experiences they went through, now help them relate to students who are going through challenges.

Maturity

“...a part of that was I've had other careers in managing people and I was older. I wasn't a 21-year-old stepping into a high school classroom. I have a little more life under my belt...I do not think that 21-year-old me would have been a fabulous teacher.” -Jessica

“I feel like I'm more equipped to teach because I've got some life experience behind me. I'm a little bit older than a normal second year teacher would be.” -Joan

“Because I was older when I went through and did this, I was 31 to 33-ish. When you're talking about 19, 20-year-olds just starting out right out of high school, and they're in an education program they need to hear they need more experience, more experience.” -James

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Maturity helps. There are a few places where there is a difference between the two groups. Age or maturity is one of them. Here we see the thoughts of several of the MAT people who felt that just due to their life experience and maturity they were better able to handle the challenge of being a classroom teacher. They questioned whether they would have been ready right out of high school and then college. Jessica sums it up, “I wasn't a 21-year-old stepping into a high school classroom. I have a little more life under my belt...I do not think that 21-year-old me would have been a fabulous teacher.” James stressed the need for more experience by stating it twice for emphasis. This illustrates that even though the MAT and traditional students for the most part have similar experiences there are some aspects that make them different.

Maturity Cont...

"I think I was most unprepared for community and parent communication as an educator. Going into the work field and working with middle school aged students as a fresh 22-year-old I did have some parents that maybe didn't see me as a professional. They would be fine over email communication. Then they'd walk in during conferences, and were like, oh my gosh, are you old enough to be a teacher? You look like my child's age. That created some boundaries that were difficult to break down. I felt like I was constantly trying to prove my worth, and I was the only new hire straight out of college that my district had had in a while and has had since then. So, I'm still one of the youngest in my group of teachers. That's definitely had an impact on the kind of communication skills that I've had to develop with community members that maybe view my input as a new way of teaching. I'm not coming from a structured background that they feel like they necessarily have had. Talking with parents, sometimes is getting better now that I'm aging. But I felt like parents originally didn't see me as an equal adult, rather as a young adult that may or may not actually know what I was talking about. So, I think that was an area that I struggled trying to make sure that people knew that I am a professional. I know what I'm doing." -Sally

19

Continuing to look at maturity, Sally gives us a look from the opposing perspective. Here she outlines her struggles as a young teacher entering the profession. Sally states, "as a fresh 22-year-old I did have some parents that maybe didn't see me as a professional...I felt like I was constantly trying to prove my worth...I struggled trying to make sure that people knew that I am a professional. I know what I'm doing." Sally faced a real struggle against age discrimination mostly in communication with parents, but we can see how that impacted her challenges and mindset entering the profession.

Research Q2: Findings

How do graduates of the MAT and traditional programs perceive their preparedness to teach?

- Similar findings for MAT and Traditional teachers
- Any professional or volunteer work was reported as a benefit
- Many benefits were the intangible even if the experience was not directly tied to the content being taught
- MAT and traditional students that are parents indicated feeling more comfortable
- Workload was a concern, but more MAT teachers felt comfortable with the time needed to complete the job
- Mentors were a valuable resource although not all mentoring experiences were the same

Research Question number two is: How do graduates of the MAT and traditional programs perceive their preparedness to teach? This question, although related to the other two research questions, focused more intently on their feelings of preparedness. Again, the perceptions reported were similar for traditional and MAT graduates. First, any professional or volunteer experiences outside of traditional education proved to be of benefit. Second, many of the benefits were not directly tied to the content of the course. Third, respondents who identified as being parents indicated that the experience of being a parent helped them. Fourth, many of the teachers indicated workload as a concern, but MAT teachers are more comfortable with the demands. Lastly, mentors were a valuable resource, but experiences varied.

Any Experience Helps the Intangibles

"Leadership all came from sports. I had a couple of part-time jobs that I would work in the summers or every Christmas break. I don't know if those helped me in the classroom. It's probably more the relationship side. I always took time to build relationships with my teachers, coaches or my managers, etc., and that probably helped in school when I had to interact with other(s)..."

-Steven

"I can remember the positive communications, especially at Chick-fil-A. I remember there are a lot of times when you're just learning to be relatable. The corporation encouraged you to try to get to know the person and try to figure out what makes them feel valued. And so, you would learn to look for things that they were wearing. Was that something that I could talk to them about? Finding these relational connections with other people translates directly to the classroom as well..."

-Stewart

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Here are a couple of responses from Steven and Stewart. Steven credits participating in and coaching sports as helping with leadership skills, along with a couple of part time jobs helping to build relationships. Stewart reminisced of his time at Chick-fil-A where he was challenged with making connections on the spot with customers and how those skills transfer directly to the classroom. These are not content related connections, but they still transfer to skills necessary within the classroom and are, therefore, quite valuable experiences.

Any Experience Helps Continued

"I do think working in food service, surprisingly was some of the most beneficial experiences that I had because it taught me how to think on my feet and talk with people. When you're working for tips you have to be able to engage with different people. So, I think that was my professional experience. But it helped me, especially in engaging with families and students. It just prepared me for a bunch of different situations and even difficult times if there were difficult parent phone calls. If I've been yelled at about pasta, I think I can handle someone who's having a difficult time with their child. That seems a bit more serious. I was prepared for those difficult conversations after working food service."

-Scott

"It really helped me gain an understanding of how they think and how they function. And so being able to do it, not necessarily every day, because drumline was just a couple nights a week, but it was already getting to work with high school students." -Jennifer

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Research question number two really focuses on these non-curricular experiences, so it is important to encompass these feelings. Here Scott and Jennifer echo the ideals of the last slide in demonstrating how experiences in non-related fields does apply to the intangibles of working as a teacher in the classroom. Scott credits his time working in food service and dealing with customer service as helping him with parental communication. Jennifer instructed a drumline before becoming a teacher and gained experience with understanding how kids think and function so she could be relatable. These skills that are transferring into preparedness are not technical nor content related but are a definite benefit to incoming teachers. It is one less thing they need to learn from scratch if they can build from prior experience.

Parent: It's a Verb

"Now as a teacher parenting, being a parent first I think has been incredibly helpful... I mean, it's hard to say I'm a parent, so I think that that lends itself to help more so than the courses that I was taught, if that makes sense." -Jane

"The mom comes out a lot because I have three boys of my own... I feel like being a mom prepared me more for classroom management than necessarily a specific class that I took at school." -Joan

"I think when you like me, I went into the classroom as a mom, so I had a little bit of a mindset of like, how would I want my teacher or my daughter's teacher to treat her? So, I felt like that kind of helped me guide how I taught my classroom and how I handled things." -Shirley

23

When it comes to teaching kids in a classroom, parenting has its benefits. As previously mentioned, teachers who indicated having children at home felt better prepared for managing kids in a classroom. Again, due to age differences between the two groups, MAT graduates were more likely to have children.

Workload and Time Management

"I was working for many hours trying to get it prepared and ready for the week. I think if I struggled with something, that would probably be the biggest one." –Jennifer

"So unprepared for the amount of workload that a teacher must carry out. In year one had many, many, many, many late nights where I would work off the clock unpaid to accomplish what was supposed to be occurring throughout the day. But there just wasn't the time. I wasn't prepared for that." - Stewart

"I've already had a different job, which was also a salaried position. So, it didn't matter how many hours I worked, whether it was more or less than the standard, 40-hour workweek or whatever. This is your salary so do this job. So, you need to make sure you do this job. I just feel like that gives me a different mindset when it comes to teaching."

-Joan

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Workload was a concern for many in this study. Jennifer indicated that she spent many hours getting prepared for the next week. Stewart recalled many, many late nights off the clock. It was something he struggled with trying to accomplish the work within the confines of the regular day, *"But there just wasn't the time,"* according to Stewart. A couple of MAT people acknowledged the workload but viewed the challenge differently. Joan, for example, compared it to a previous salaried position, *"So, it didn't matter how many hours I worked, whether it was more or less than the standard, 40-hour workweek or whatever. This is your salary so do this job. So, you need to make sure you do this job."* A couple of MAT people who had previous salaried or self-employed careers expressed that they were appreciative of the salary and not as sensitive to working outside of normal hours to complete the job. The idea of working outside of regular hours was not a shock to them.

Mentoring Varies

"...the biggest help, was the instructional coach, my mentor teacher. Still talking to just my regular coworkers, really, really helped." -Sara

"The mentor that I was set up informally, was a math teacher down the hallway, and she was an amazing resource. Her experience that she'd been at the district just a little bit longer than me was significant in helping me kind of get my bearings on things..." -Sally

"There was no mentor because I was the one and only business teacher." -Joy

"No, the middle school did not. They had teams." -Sheila

"I remember that lady from that school. I think her words were something like, don't bother me. I'm your mentor. I'll check in with you when I want to." -Joy

"I worked two years with a veteran teacher...because every school district has their own unique ins and outs and policies. As a newbie, you might not understand. I thought that the mentor program at the district was really good." -Jessica

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Most teachers reported that when they felt unprepared or needed some help, they had a strong and positive connection with a mentor in their building whether it be a formal mentor or simply a peer. Here Sara expressed the benefit of both formal and informal, "...the biggest help, was the instructional coach, my mentor teacher. Still talking to just my regular coworkers, really, really helped." Sally and Jessica both had positive examples here as well as most other examples I could have quoted from the research. However, not all things can be controlled for. Sometimes a mentor in the same content is not available locally. Joy explained, "There was no mentor because I was the one and only business teacher." Sheila talked about being in a middle school model, "No, the middle school did not. They had teams," where subject areas were mixed. Finally, Joy also discussed that mentor lady, "I remember that lady from that school. I think her words were something like, don't bother me. I'm your mentor. I'll check in with you when I want to." A new teacher might not be comfortable addressing a poor mentor, but it creates an even worse situation.

Research Q3: Findings

How do graduates of the MAT with prior work experience and traditional program graduates perceive their comfort in classroom management, content, and pedagogy?

- Similar findings for MAT and Traditional teachers
- Lesson planning very prepared if not over prepared
- Curriculum mostly prepared especially if a well-defined curriculum exists
- Classroom management was a struggle for most
- A couple of MAT teachers reported themselves as more comfortable due to past experiences

Research question number three: How do graduates of the MAT with prior work experience and traditional program graduates perceive their comfort in classroom management, content, and pedagogy? Again, in line with the literature and among both groups, the results were similar. In terms of lesson planning, they felt possibly overprepared. Curriculum was an area that was mixed but mostly positive, especially if there was a good curriculum in place already. Classroom management was by far the biggest struggle for most. A couple of MAT teachers reported that they did not struggle as much with classroom management due to their past experiences.

Lesson Plans, We Got It!

"I felt completely prepared with lesson planning and actually almost over-prepared for lesson planning, because of the stuff that I learned at the University of Central Missouri... formal lesson plans and all of that weren't all particularly required in the district that I worked at. So, I felt over-prepared." -Sam

"Lesson planning? Pretty well prepared. I feel like I'm pretty good at being able to lay out what my whole class should look like for the day." - Julie

"We would write out lesson plans. They were not necessarily structured lesson plans like filling out a worksheet or a template. We would focus on the steps that we were going to complete, more like a bullet point list. Then we would put in little bits of details where we felt like we might need a reminder and then we also associated that with the amount of time it was supposed to take. Doing that heavily transferred over and helped me significantly my first-year teaching." -Sally

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Sam describes a situation echoed by many. The formal lesson plans that were part of both preparation programs at UCM were above and beyond what they are required to use when working at their school districts. The sentiment was not that it was necessarily a bad thing, but they were able to address curriculum as needed due to their training. Teachers would address the aspects of what they learned in their formal training, but in a much-abbreviated form.

Good Curriculum Helped

"Well, curriculum wise, I have I've always said I was fortunate that I entered teaching at a time when DESE and the DESE business and marketing department were very strong. They had a curriculum for each of the subjects I was teaching... the others were jealous. They were like, all you had to do was go pull that up? And I'm like, it was right there. So, I felt supported by that." -Joy

"Curriculum? I felt good about my classes and how well they prepared me. I felt like I had the depth of knowledge that I needed to answer any kind of questions the students might have had, and to give adequate reasoning for why we were doing the content that we were learning." -Susan

"Initially, going into my career in education, I think that I had a really good understanding of textbook curriculum in the sense that, like, I knew how to read curriculum. I knew how to structure it and create it and derive a lesson plan, but I struggled a little bit with the implementation." -Sally

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Overall, teachers praised being able to understand the how and why of curriculum. The application may have been a slight struggle, but access to a good curriculum was helpful. Joy shared her experience and how she felt blessed to have such a well-defined curriculum already in place that she could just pull it up and use it. Having support systems like that in place allows teachers to focus on the implementation rather than development of curriculum.

Classroom Missed Management

"I felt woefully unprepared. Horribly, horribly."

-Sara

"I don't feel like anyone's ever really prepared to go into a classroom. No matter how many times you talk about classroom management. I mean, until you really get hands-on control of your own classroom, I don't really think anyone's prepared to walk into a classroom." -Shirley

"I think that's probably what I struggled with the most. But I think that's also such a hard thing to do. I feel like I knew my philosophy, I knew what I wanted to do, but really, until you're in the classroom and until you're in that situation with the kids, you have to be malleable." -Scott

"I was going to say the one thing that I feel like I was not prepared for was classroom management.

There's just no way to learn that from a textbook or from assignments. How you're actually going to need to react in the moment. It's like there's all of these great ideas of things that you can try to do, but every kid is different, so every class is different."

-Joan

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Classroom management is the elephant, except everybody wanted to talk about it! I think Sara wraps it up nicely, "I felt woefully unprepared. Horribly, horribly." Overall, this was the area with the most reported struggles. It was an area of concern that many expressed the thought that until you are doing it, you won't be able to learn it. Scott said, "I knew my philosophy, I knew what I wanted to do, but really, until you're in the classroom and until you're in that situation with the kids..." Joan further echoes, "There's just no way to learn that from a textbook or from assignments." These comments pretty much wrap up the sentiment that you won't know if you are ready until you are in a fight. Most teachers thought the theory of classroom management, even if helpful for principle, wasn't helpful with the application in the moment.

Classroom Management MAT Style

"...coming from the business world, that clicked with me because I knew there were procedures to do everything, you know, in a business. So that I followed those methods and that really helped me in the beginning with classroom management."

-Joy

"Very prepared. But again, a part of that was I've had other careers in managing people and I was older. I wasn't a 21-year-old stepping into a high school classroom. I have a little more life under my belt." -Jessica

30

Contrary to the vast majority of teachers in this study, there were a couple of MAT teachers that actually reported being comfortable with classroom management. Interestingly, both regard their prior professional experience as being the catalyst for their success in the classroom. Jessica related it directly to managing people in her previous position. Joy, meanwhile, was able to relate the procedural aspects of business to the structure that she applied to the classroom.

Findings



- Both the traditional and MAT teachers had similar feelings of preparedness entering the classroom, although MAT teacher had some advantages
- Student Teaching and observations were program requirements that most thought were extremely beneficial but could be expanded
- Course and experiences in the programs aimed at teachers or that were directly application focused proved invaluable
- Technical and professional skills lead to feeling more prepared entering the classroom, typically limited to MAT teachers
- Many other job or life experiences also transferred into feelings of preparedness, especially in non-content aspects of teaching
- Having a well-developed curriculum reduced workload and stress
- Good quality mentoring programs benefited teachers

So, what did we learn in the end? Overall, both MAT and traditional teachers had similar feelings of preparedness. MAT teachers did benefit from maturity and professional experiences that may have given them a slight advantage as a new teacher, including having children of their own. Student teaching and observations were curricular experiences that were valued by teachers entering the profession, but participants did ask for more. Courses and experiences that were tailored to teaching or application and methods based were favored over theory-based courses. Technical and professional skills aided teachers to be more prepared entering the classroom, however this is typically limited to MAT due to their additional experience beyond their initial degree. There were intangible benefits that can be attributed to almost any job or life experience outside of standard teacher preparation programs. Finally, having a well-defined curriculum and mentoring program was seen as very beneficial and supportive by the teachers in this study.

- Admissions and programs aimed at prospective teachers should encourage and promote extracurricular and job experiences of all kinds
- MAT promotion should discuss the benefits of maturity and professional experience
- Opportunities for observations should be expanded and diversified
- Student teaching should happen in varied environments to prepare new teachers for a more realistic experience when first entering the classroom; MAT may need to focus on more classroom visits
- Courses could be focused more on application than theory, aligned better with what teachers are expected to do in the classroom

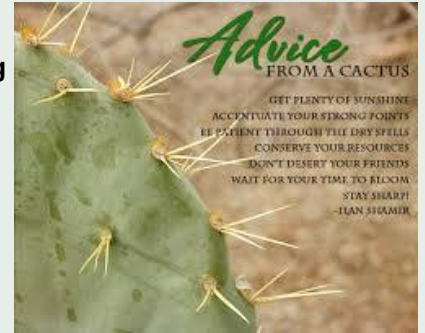
Program Suggestions



What should we do about it? Admissions and programs for future educators should stress the importance of extracurricular and job experiences of any kind. Outreach for aspiring educators should promote experiences that develop intangible skills. Promote the MAT program as having a benefit to prospective employers. Opportunities for observations should occur from the beginning and continue throughout the program. Teaching candidates should be required to visit a variety of classes, grade levels, and districts. Student teaching should also occur in more than one environment and should be varied by district, demographic, and subjects or grade levels. A concern is that many teachers are teaching full time and concurrently completing student teaching. For those teachers, it should be included that they visit varied districts or classrooms as part of the student teaching. Teacher preparation should focus more on application and less theoretical knowledge to better align with the expectations of new teachers.

Support Suggestions

- The university could support a Curriculum Share; similar to course share
- Develop a support platform for new teacher to provide networking or mentoring opportunities
- Expand opportunities for students to work on developing curriculum while simultaneously supporting local districts



The university should seek to strengthen the experience of curriculum alignment among teaching candidates by providing a curriculum share database. This database could be developed by students of each program and house a complete curriculum based upon state standards. It could also be broken down by each teachable unit. Essentially, it could provide all the curriculum development that should happen at a district level. The only thing missing may be the resource alignment as each district's resources may vary. It could, however, have links to free and available activities. This could provide a huge relief for new teachers who might normally be staying up late trying to develop a curriculum on their own. This way, new teachers could focus on teaching and not curriculum writing. Speaking of late nights, where does a new teacher find help when it is 7 in the evening, and they have a question? It probably isn't asking a mentor or veteran teacher that already left for the day. It might be worth some thought of pursuing a support system for recent graduates as they move into their first year of teaching. It could provide someplace where they could reconnect with other first year teachers. This would especially benefit those who start teaching at smaller schools or need after-hour support on those late nights. In addition to the curriculum share database, the university could house a mentor/peer forum, a Facebook page, etc. where new teachers can reach out for assistance and support. Finally, curriculum share could be used by the university to provide services to local districts and help train teachers at the same time. Teachers in training need to learn curriculum development skills and districts need a curriculum aligned to their resources. Teaching candidates could provide the resources to support local districts to develop a well-defined curriculum that they may end up using in their first teaching job. This is the pie in the sky!

Future Thoughts

- How does a teachers perceptions change between the first and second year of teaching
- When searching for participants it appeared that many teachers are not currently teaching, what are their experiences?
- This study focused on STEM teachers but could be expanded to other areas
- How does the attrition rate of MAT teachers compare to traditional teacher preparation



What's next? During the study there were some other interesting things that occurred that brought up more questions. I asked about how they felt during their first couple of years of teaching. It would be interesting to survey teachers in year one and then in year two to see if some of the newness is alleviated. I also noticed that many people had active certifications but were not listed as working according to the DESE website. Those teachers who left the classroom should be given a voice. This study focused on STEM teachers but could be expanded to all areas to see if similar patterns exist. Finally, if examining these two groups, how do they compare when attrition is considered?

Questions?



- Please feel free to ask anything you would like to about my dissertation or in general
- If something comes to mind later, you may contact me by email at tpwvg5@umsystem.edu
- Thank you for your time and assistance with my dissertation, You are greatly appreciated!

Please feel free to ask questions or make any comments that I should consider. If you think of something later and would like to reach out, my contact information is listed here. I hope you found something in this study that is useful, and I thank you for taking the time to assist with this scholarly paper. You are greatly appreciated!

SECTION V: CONTRIBUTION TO SCHOLARSHIP

Do professional skills transfer to educator preparedness?

A case study of Master of Arts in teaching and traditional education majors at the University of Central Missouri

The problem facing education is a current and projected shortage in the number of STEM educators. Alternative certification (AC) programs have been instituted to increase the number of educators in STEM-related fields. Many states have implemented AC programs aimed at transitioning current career professionals into the education field (Harvey & Gimbert, 2007; Kirby et al., 1989; Lee & Lamport, 2011; Washburn-Moses, & Rosenberg, 2008). AC programs have exploded in popularity and produced almost 30% of the new teachers entering education in 2018-2019 (Fenwick, 2022). With the dramatic increase in the number and popularity of such programs, there have been questions as to whether this is a viable option for producing quality new teachers. Temporarily this has helped, but is it a good long-term solution?

Because there are so many diverse types of alternative certification programs, teachers graduating from these types of programs are exposed to various levels of educational training. Some programs are lengthy and very structured, providing an experience similar to traditional teacher training programs. In contrast, some AC programs are designed to get teachers into the classroom quicker and, therefore, are less structured. Because there is no national standard for AC programs, the amount of coursework and student teaching requirements differ greatly (Boe et al., 2007; Carter & Keiler, 2009; Chait & McLaughlin, 2009; Jeanpierre, 2007). This has led to questions about the quality of AC programs and the quality of teachers they produce.

Even though research has been conducted on numerous programs to determine the program's effectiveness, more research must be done to determine how various amounts of pedagogy, supervised teaching, and prior experience affect educator quality (Boe et al., 2007). Because there are so many variations within AC programs, AC programs must be studied to narrow down specific components that comprise a high-quality AC training program. The teacher shortage is a problem and alternative certification may help to provide an additional avenue for teachers to enter the profession. Bowling and Ball (2018) question whether alternative certification programs adequately prepare teachers for the classroom. They further contend that this lack of preparation may create just another problem for education through higher turnover (Bowling & Ball, 2018).

Review of the Literature

Even though there are some who argue against a teacher shortage, most research does indicate a shortage based on subjects or location (Cowan et al., 2016; Dee & Goldhaber, 2017). In addition, some research suggests that the shortages have been part of the educational system for many decades, and reform has not addressed the problem (Sutcher, Darling-Hammond, & Carver-Thomas, 2019; U.S. Department of Education, 2016).

To address shortages, many policies have been implemented aimed at putting more qualified teachers into the classroom. Further research describes an increase in the number of options for possible teacher candidates to enter the classroom (Bowling & Ball, 2018; Zhang & Zeller, 2016). The literature mostly focuses on three types of teacher certification programs: traditional, alternative, and "other". Each type will be defined and analyzed to show the current trends in teacher preparation. The research shows a vast

difference in the results of many of these programs and the experiences that teachers have in the classroom after leaving the various types of programs (Fenwick, 2022; Ingersoll, Merrill & May, 2012).

Becoming a Teacher

Depending on the type of teacher preparation program, there are varied requirements for teachers to enter the classroom. There are three paths to initial certification (Bowling & Ball, 2018; Dee & Goldhaber, 2017). The first is the traditional pathway that was mentioned earlier and will be described in further detail. Second, an alternative pathway that usually starts with a candidate who already possesses a bachelor's degree in another field wishing to transition to teaching is called a career changer (Zhang & Zeller, 2016). Finally, there are emergency or temporary certifications that can be issued in the case of severe shortages that impact immediate functioning of the education system (Larios et al., 2022; Mobra & Hamlin, 2020). The type of program a candidate chooses depends on several factors, but each path satisfies the same need in a different way: the need for more teachers. In California, the need for teachers is so great that the number of emergency and temporary permits quintupled in four years' time (Sutcher et al., 2019). Generally, emergency or temporary permits are a stop gap that does not lead to permanent certification and will not solve the teacher shortage issue, so the discussion will focus on traditional and alternative certification.

Alternative Certification

Alternative certification (AC) programs have the potential to help alleviate the teacher shortage and quality issues along with increasing diversity and retention (Koehler et al., 2013; Scribner & Heinen, 2009). Policy makers and government officials have

recognized the potential of AC programs and have created programs such as Troops to Teachers and Transition to Teaching grants to expand AC programs and attract professionals from business and industry, including military veterans, to begin a teaching career (Harvey & Gimbert, 2007; Lee & Lamport, 2011).

Many colleges and universities have responded to the economic, educational, and political calls to increase the number of certified teachers by creating numerous pathways to certification, often circumventing traditional program requirements (Fenwick, 2022; Harvey & Gimbert, 2007; Kaplan, 2012). Traditional master's programs in education were meant to provide in-depth theory and knowledge for those already certified to teach (Selke, 2001). The new AC programs, including those where graduates earn a master's degree, allow career changers who have content knowledge and professional experience the opportunity to gain their initial certification faster, saving time and money, oftentimes allowing them to teach while they are completing the requirements for certification (Fenwick, 2022; Larios et al., 2022; Lee & Lamport, 2011; Ng & Peter, 2010; Scribner & Heinen, 2009; Zhang & Zeller, 2016).

Since the number of AC programs and the number of teachers entering the profession through AC has increased, the question about the quality of teachers receiving certification by alternative means has become a dividing factor among researchers (Bowling & Ball, 2018; Fenwick, 2022). Evans (2010) suggested that the argument over which program type, traditional or AC, produces the best results is unresolved in the research. Moffett and Davis (2014) stated that the research comparing the quality of traditional versus AC programs is not new, but instead acknowledges that both forms of teacher preparation may be producing questionable results. Bowling and Ball (2018) still

affirm that alternatively certified teachers are viewed as being less prepared or inconsistently prepared at best.

Alternative Certification compared to Traditional Programs

AC programs differ greatly concerning the requirements needed to enter an AC program, the number of hours necessary, and the amount or extent of supervised internship candidates must complete to attain an initial teaching certification (Chait & McLaughlin, 2009; Dee & Goldhaber, 2017; Ng & Peter, 2010; Stanley & Martin, 2009). Moffett and Davis (2014) argued that traditional programs have the greatest requirements for teachers and AC programs are a way to circumvent a traditional four-year undergraduate degree. Fenwick (2022) agrees that most alternative certification providers use loopholes to skirt rigorous standards. Moffett and Davis (2014) recognize that most AC programs require a bachelor's degree for admittance but contend that it does not have to be in education.

More recent research has started to investigate how previous professional experiences relate to the classroom environment. Vaidya and Thompson (2020) describe that approximately half of the teachers they interviewed made the adjustment to teaching by drawing on prior experiences. Alharbi (2020) points out that career change teachers not only benefit from the application and content knowledge but from other soft skills like managing people or stressful situations. Anderson (2014) contradicts this view and instead reports that one subject stated that their early career did little to prepare them for the classroom. They further state that industry experience was so different that a new skill set must be learned for the classroom.

Another major difference between traditional and AC programs is the amount and type of mentoring, internship, or supervised teaching experience a candidate must complete (Bowling & Ball, 2018; Dee & Goldhaber, 2017; Sutchter et al., 2019). The amount, quality, and length of mentoring and internship vary widely (Chait & McLaughlin, 2009; O'Connor et al., 2011; Salgado et al., 2018; Scribner & Heinen, 2009; Stanley & Martin, 2009). Compared to the extensive student teaching experience of a traditional program, many AC programs allow the teaching candidate to work full time as a paid teacher while completing certification requirements (Boe et al., 2007; Fenwick, 2022; Larios et al., 2022; Zhang & Zeller, 2016).

Due to the extreme variation in AC programs, there has been much debate over the quality of teachers entering the workforce through non-traditional pathways (Moffett & Davis, 2014). Robertson and Singleton (2010) shared a sentiment of AC critics and suggested, “assigning students to teachers who entered through shortened preparation programs was as inconceivable as entrusting them to the care of a doctor who had 6 months of intensive course work and a mentor in the next room” (p. 216). Some believe that AC programs undermine teaching as a profession and the overall perception is that AC trained teachers are not as highly qualified as traditionally trained candidates (Bowling & Ball, 2018; Moffett & Davis, 2014; Robertson & Singleton, 2010).

A main focal point in the debate is the focus on content over pedagogy. Salgado et al. (2018) assert that alternative certification programs do not provide as much training on instructional methods and pedagogy as traditional programs. This lack of pedagogy training occurs on the job as teachers are already teaching in the classroom and leads to higher rates of attrition (Ingersoll et al., 2012; Zhang & Zeller, 2016). Pankowski and

Walker (2016) promote a teacher preparation program involving the simulation of classroom situations, as it connects knowledge to action. Without rich pedagogical teaching experiences, alternative certification can be viewed as a sink or swim approach when it comes to non-content preparation (Zhang & Zeller, 2016). Rotherham and Willingham (2009) argued that being a subject matter expert does not automatically and instantly make someone a great teacher.

Teacher Perceptions

AC certified teachers also noted some benefits they perceived due to their prior professional and life experience (Alharbi, 2020; Vaidya & Thompson, 2020). Many AC certified teachers believed that they had advanced content knowledge compared to traditionally trained teachers, especially if their previous work or degree was related to their subject area (Hung & Smith, 2012). Sappa et al. (2015) have shown positive results of second careers for current teachers, not just previous careers. They contend that the experience and continued application outside of the classroom translates directly to a more positive classroom experience.

Even more dramatic was the perceived benefit of general work experience and life experience even if it was not directly related to education or the subject being taught (Alharbi, 2020; Ng & Peter, 2009). Robertson and Singleton (2010) noted that although traditional teachers could receive more pedagogical training, they lacked the real-life practical experience that AC teachers have entering the program. Anderson et al. (2014) suggest that career changers do have promise due to content expertise, professional experience, and maturity; however, this may pose new challenges in adjusting to teaching.

Recommendations for Alternative Certification

Proponents of AC programs are still touting AC to alleviate the teacher shortage although most are suggesting targeting areas of concern and better regulation (Dee & Goldhaber, 2017; Fenwick, 2020). Opponents of AC argue the quick licensure programs are producing inferior teachers who lack the pedagogical training necessary to be effective and are a short-term solution to a long-term problem (Bowling & Ball, 2018; Heilig & Jez, 2010; Rotherham & Willingham, 2009; Zhang & Zeller, 2016).

In addition to structural and policy changes, it is evident through the research that changes can be made to the current AC programs to alleviate some of the concerns with both AC and traditionally prepared teachers. First, providing mentoring opportunities or rich simulation style preparation may help with classroom management and administrative concerns (Pankowski & Walker, 2016). Secondly, the expectations in workload or means to deal with time management and selfcare need to be stressed (Larios et al., 2022; Vaidya & Thompson, 2020). Finally, teachers need to be recognized for what they bring to the table, financially and otherwise (Alharbi, 2020; Anderson et al., 2014; Howes & Goodman-Delahunty, 2015).

Purpose of the Study

The purpose of this study is to gain an understanding of the experiences of STEM teachers who have completed the Master of Arts in Teaching (MAT) program at the University of Central Missouri (UCM) compared to those completing a traditional teaching preparation program. The MAT program is an AC program designed to allow individuals who currently have a bachelor's degree in another field a path to earn initial teaching certification. The MAT program at UCM is an AC program that includes

coursework in pedagogy along with a supervised internship. The supervised internship takes the place of a separate student teaching internship and is usually conducted while the student works full-time as a first-year teacher.

This study will compare the experiences of MAT teachers in their first few years of teaching with teachers who graduated from UCM through the traditional teacher education program. Post et al. (2004) suggest that MAT programs have several quality control features which make them different from traditional programs, and the requirement of a bachelor's degree will ensure deeper content knowledge. Zhang and Zeller (2016) specifically allude to the requirement of a bachelor's degree as being significant to enter an AC program.

Evans (2010) contends that the argument over which certification route produces the most competent teachers is unresolved. Current research indicates that AC teachers are not as successful (Bowling & Ball, 2018; Fenwick, 2022), while Dee and Goldhaber (2017) caution about making claims about effectiveness based on conventional certification.

The study will compare these experiences to identify differences between MAT teachers and traditionally trained teachers. If the experiences are similar, it would suggest that the MAT program is producing equally qualified teachers. It would also validate the teacher preparation practices utilized within the MAT program at UCM.

Research Questions

The research questions guiding this study are:

1. What curricular or professional experiences do teachers consider to be critical to their success as a teacher?

2. How do graduates of the MAT and traditional programs perceive their preparedness to teach?
3. How do graduates of the MAT with prior work experience and traditional program graduates perceive their comfort in classroom management, content, and pedagogy?

Theoretical Framework

Throughout the research, it is evident that scholars believe there are certain qualities of teacher certification programs that produce high-quality teachers such as pedagogy training and supervised teaching (Boe et al., 2007; Harvey & Gimbert, 2007; Salgado et al., 2018). In this study, one focus will be on identifying which characteristics of the MAT program at UCM are effective in meeting that goal. The assumption is that certain aspects of the program will cause expected outcomes related to teacher quality.

The expectation is that graduates of traditional teacher preparation programs and alternative certification programs will successfully apply the skills and knowledge learned in class to the classroom. Many colleges measure their success by the transferability of the graduate's skills to the workplace (Green, 2013). Macaulay (2016) defines transferability as the "application of skills or knowledge learned in one context to another." Several researchers have suggested that transfer of learning is the fundamental idea of traditional education and that students demonstrate the concept when they apply in practice what they have learned in theory (Botma et. al, 2015; Day & Goldstone, 2012; Green, 2013). This theory is nothing new, and it is a derivative of the seminal work by Woodworth and Thorndike (1901), who conducted several studies demonstrating that the improvement of one mental function may have positive effects on other functions.

Day and Goldstone (2012) contend that the transfer of learning does not happen as directly as many theorists would describe and that there are many factors affecting transferability from theoretical learning to application. This study will use the transfer of learning or transferability theory to examine the differences in application based upon the prior learning experiences of those who have prior work experience in a STEM-related field and those who graduate from a traditional teacher preparation program (Day & Goldstone, 2012; Nokes-Malach & Mestre, 2013). The study is trying to understand how skills learned through real world experience and traditional teacher preparation programs are applied to classroom experiences.

Design of the Study

Setting

The University of Central Missouri is located in Warrensburg, a medium-sized town of approximately 19,000 people in the heart of Missouri, approximately 60 miles east of Kansas City. The town has a mostly rural and farming history but is influenced strongly by the university and neighboring Whiteman Air Force Base. For these reasons, the town has a strong emphasis on education and is more culturally diverse than most similarly sized towns in the Midwest (Fast Facts, 2023).

The university has a strong bond with the community as it is the main draw to the town, and the 14,000 students attending UCM greatly enhance the local population. The university offers more than 150 programs of study from undergraduate and certification programs through doctoral cohort programs. UCM has a strong reputation in the fields of education, nursing, criminal justice, and computer technology (Fast Facts, 2023).

Methodology

The design of the study was a qualitative case study. Qualitative design matched the focus of the study on the experiences of the teachers in the classroom. According to Creswell (2014), qualitative research is applicable to situations where the variables are not defined and controlled. This process is referred to by Merriam and Tisdell (2016) as being inductive, where meaning is being derived through the process of research rather than trying to prove or disprove a predefined theory or hypothesis. The research process was designed to understand or derive the meaning behind a phenomenon or situation.

Qualitative research also focuses on the personal experiences of the participants involved (Creswell, 2014). This related directly with the basis of the study focusing on the perceptions of STEM teachers graduating from the MAT and traditional teacher preparation programs. From these experiences, an understanding of how prior experience impacts teaching preparedness was developed.

Participants

Participants for this study were selected based upon successful completion of the MAT or traditional education program at UCM specializing in a STEM certification area and having taught for at least one semester after completing the program. This type of purposeful sampling is common in qualitative research where the researcher wants to understand or gain insight about a specific case (Merriam & Tisdell, 2016). The participant pool was identified by contacting the academic advisor for the MAT program and the certification office for traditional candidates. The study was able to collect data from 10 traditional students and 7 MAT once all available means had been exhausted to contact graduates identified through the certification office. Purposeful sampling is

appropriate due to the bounded constraints of the programs being studied (Merriam & Tisdell, 2016).

Program acceptance and requirements were acquired from the university website and triangulated with participant experiences for validity (Creswell, 2014). State certification requirements were validated by referencing the Missouri Department of Elementary and Secondary Education website. Merriam and Tisdell (2016) suggest using multiple forms of data and collection methods to triangulate results for reliability and validity reasons.

Data Collection and Analysis

Each of the participants was interviewed and the interviews were then transcribed for analysis. Each interview lasted approximately 30-60 minutes in length and was recorded and transcribed.

Transcribed interviews were examined for common categories and themes. Seidman (2013) suggests reading several transcripts and identifying interesting data excerpts from each, then developing categories from which common themes can be developed. Merriam and Tisdell (2016) describe a similar process using open coding and then narrowing categories down by axial coding. It is also a common mistake to try to develop themes too early in the process and then try to force new data into existing themes, thereby misconstruing data from the onset (Seidman, 2013).

Data from this study were processed following the steps outlined by Seidman (2013) and then axial coding to narrow the number of categories. Interviews were read and interesting facts identified. A minimum of three interviews were processed before any categories were developed. In addition, a theme was considered when at least three

individual participants describe a common idea. Themes were then analyzed and combined until a recommended number of 5 to 7 major themes were developed (Creswell, 2014; Merriam & Tisdell, 2016).

Merriam and Tisdell (2016) suggest using triangulation to ensure internal validity of the study. This means using multiple methods or sources to validate the outcomes of the study. In addition to interviews, an analysis was performed using the UCM website and the UCM course catalog to determine and compare the curricular components of each program. It is a good idea to use multiple methods of data collection to improve validity (Creswell, 2014; Merriam & Tisdell, 2016).

Results were also compared to existing research to strengthen the reliability of the study through triangulation and build on the ability to generalize the results. Although qualitative studies are usually not generalizable, if several studies show similar results, a generalizable theory may eventually be developed or applied through user generalizability (Creswell, 2014; Merriam & Tisdell, 2016).

Findings

This study attempted to determine the feeling of preparedness of teachers entering the classroom from the traditional program or the MAT program at UCM. The focus was on the experiences that teachers had before entering the program that helped them be successful. The research questions gathered perception data related to different aspects of teaching and preparation to investigate the connections between preparation and preparedness for these two groups of teachers. The following is an overall directory of participants and then a discussion of the themes and results for each research question.

Table 1: Directory of Participants

Name	Program	Years	Subjects	Previous Occupation	Grade Level
Sara	BS	2	Biology, Chemistry		9-12
Steven	BS		Coaching		College
Sam	BS	8	Physical Science, Chemistry		9-12
Sally	BS	8	Science, STEM		6-8
Stewart	BS	5	Life Science, Physical Science, Integrated Science		
Stacy	BS	5	5 th Grade Science, Math, Geometry, Alg. 2, Trig., Statistics, Pre-Algebra, Geometry, Applied Geometry		5, 8, 9-12
Shirley	BS	7	Math, Algebra		6-8
Scott	BS	6	Math, Leadership		5-8
Susan	BS	5	Geometry, Integrated Math, Trigonometry, College Algebra, Calculus		9-12
Sheila	BS	6	Science, History		6-7
Jennifer	MAT	7	Chemistry, Drums, Theoretical Chemistry, College Prep	NA	10-12
Joan	MAT	2	Math, Project Lead the Way, Physical Science	Business Marketing	6-7
Julie	MAT	3	Agriculture	Ag Industry	9-12
Jessica	MAT	11	PE, Art, Math, Science, Current Events, MS Reading	Law Enforcement	K-2, 6, 9-12
James	MAT	5	Algebra 2, Geometry, Pre-Calculus, Geometry in Construction	Engineering	9-12
Jane	MAT	4	Project Lead the Way	Healthcare	7-8
Joy	MAT	17	Business, Finance, Personal Finance, Elementary Sped	Corporate Sales	K-4 7-12

Themes

When the data were being analyzed, three themes were consistent within the research. First, traditional teachers and MAT teachers reported similarly when asked about coursework and professional experiences that were most valuable; about their feeling of preparedness; and their comfort in classroom management, content, and pedagogy. Second, both groups of teachers preferred application and methods style courses and pointed to observations and student teaching as valuable curricular components. Third, all experiences, both professional and personal, proved beneficial when entering the classroom. These themes became apparent as most participants had similar stories during the interview.

Traditional and MAT Similarities

When asked about coursework and professional experiences that were most valuable; about their feeling of preparedness; and their comfort in classroom management, content, and pedagogy, the responses were similar for traditional teachers and MAT teachers. This aligns with the research that suggested that the experiences of teachers entering the classroom were similar regardless of their path to certification. This is important for two reasons. First, research can continue without regard to the type of certification program and instead focus on the specific issues teachers are experiencing. Second, any possible solution or implication could hopefully be applied to any preparation program.

Application and Applied Coursework

Again, when asked about what type of curricular components that were part of their teacher preparation program were beneficial, there were numerous responses that

discussed application and applied coursework as being the most important. Students preferred courses that were directed at how to teach the content rather than just learning the content. They preferred courses that were less theoretical and more application based. Finally, many of the respondents claimed that student teaching was where they finally developed as a teacher. Observations came in as a close second to student teaching in curricular experiences that teachers reported as beneficial.

All Experience Helped

Finally, when asked about what experiences outside of teacher preparation benefited them when entering the classroom, almost everyone had a story that connected some previous experience with how it helped them in the classroom. This is where things shifted slightly between the two groups. Because MAT teachers were typically older and had professional experiences after completing their original degrees, the results did not match entirely.

Several MAT teachers reported that their professional experiences related to the content they teach in the classroom. They also reported feeling more comfortable entering the classroom simply based upon their level of maturity. Lastly, a couple of the MAT teachers reported feeling more prepared because they are parents whereas only one traditional teacher reported being a parent and they also felt that was beneficial.

Teachers from both groups did speak positively about other job-related experiences and personal experiences that benefited them in intangible skills. It became apparent from their stories that any type of job, leadership, extracurricular experience benefited them in areas of management, communication and relationship building.

Several also made connections to their own personal experiences, such as dyslexia or being part of the LGBTQ community as helpful in relating to students.

Research Questions Answered

RQ1: What curricular or professional experiences do teachers consider to be critical to their success as a teacher?

The main findings for research question number one were that the experiences of MAT and traditional teachers were similar. Prospective teachers found coursework that was targeted towards teachers as beneficial compared to strictly learning content or theory. Student teaching and observations were curricular components that most agreed were the best teacher preparation experiences. Technical work experience was valuable for those who had that experience, typically MAT graduates. Life experiences and maturity also played a role in the experiences of teachers entering the classroom.

Applied Curriculum

Teacher candidates preferred courses that were focused on teaching the content and were application based. Susan discussed the type of courses for teachers, “I don't remember the specific name, but they were math teacher-focused, so we were only math teachers in there. I think there was a middle and high school levels...That is what I really felt prepared me for the classroom.” Sally recalled her content courses, “I think that if I were to go back and change one thing, it would have been to have more of those science classes that were education based rather than general science.” Joan reiterates the need for strategies courses, “They all focused around the same thing...One of the classes was the one with the lesson planning. I think that one was called instructional strategies for middle school mathematics...”

Student Teaching and Observations

Overall, student teaching and observations were considered invaluable. Sam describes his student teaching, “The student teaching was like having your boots on the ground. Being in the classroom definitely helped...But where we actually got experience in a real classroom helped more than anything else did...” Others discuss the benefits of observations. James proposed, “I think as much shadowing or observation that you can do the better.” Jessica wished, “I wish that I would have done a more varied teacher observation” Stacy expressed an interest in more observations, “Honestly, I think I would have figured out a way to go in and do more observations.”

Technical Experience

Technical work experience was beneficial to support content. This is one of the main differences between the two groups of participants because MAT teachers typically have professional experience beyond a typical entry level job. James tied it all together with this comment:

I got a bachelor's degree in civil engineering. I worked in the industry for eight years as an engineer and a project manager...there's a huge relationship between managing a crew of adult men and women and a classroom. Even though it might not sound like it, my project management role was overseeing and managing personalities, people, and relationships between us and the client...effectively leading meetings, being able to be a leader, but also letting people speak and listen. And so that directly relates to teaching. I'm able to bring those skills into the classroom. I know how to best equip kids to work together, work with me, and hopefully those leadership skills I brought translate to the classroom.

Julie also describes how her experience in the agricultural industry applied to her classroom and relatable experiences to teaching FFA.

I did a lot of like public speaking events then, which obviously helps with having kids in the class and standing up and then being and being able to help them with those same skills... With my previous job, I conducted meetings to educate farmers. I worked with a lot of older men, and I wanted to bring my knowledge to students so they could benefit from FFA in the same way that I did...I brought like ten years of experience to the classroom with that background.

Jessica credits her experience and training in Law Enforcement for being able to adjust to situations in the classroom. She shared,

I have a background in law enforcement so conflict mediation, clear and concise communication, those were two things that I think really keep a pretty calm head, and especially at the alternative school when emotions were high. I was able to keep, just a calm open mind.

Joy has worked in business and management for several years and had this to say about her experiences and how they relate to the classroom,

I always say that being in the business world for seven years...all of those professional experiences helped me be a better business teacher. I also owned a couple of small businesses during that time and so that's why I told the students, I know what businesses are looking for. I know what software is being used.

Life Experiences

Family and life experiences helped make them relatable as new teachers.

Jane credits being a parent as being extremely helpful, “Now as a teacher, being a parent first I think has been incredibly helpful.” Shirley also shares, “I went into the classroom as a mom, so I had a little bit of a mindset of how would I want my teacher or my daughter's teacher to treat her? So, I felt like that helped me guide how I taught my classroom and how I handled things.” Sheila describes how her personal struggles made her relatable as a teacher.

Then being dyslexic, I can read fine, but I switch and mirror image things a lot.

So, like in Kansas City, where I grew up my whole life, there is 435 highway and I'm always looking for 534 highway and never remember that I flipped the number myself...Like when I would catch a kid doing something like that, I'd be like, oh, I do that too and this is how I learn to do it.

Scott attributes his success to his personal experience,

Myself I endured a pretty heavy amount of trauma growing up. So being able to relate to students on that level. My strength is definitely in teaching and learning with kids with social, emotional, behavioral issues or struggles and just being able to relate to them because of issues with being part of the LGBT community and not really being in an area where that's accepted. I think that really prepared me the most for how these kids feel, and being able to handle the level of stress that a lot of them do. Learning from tough times is really going to help you when you struggle, and you have those experiences. I think that's what helped me the most as far as becoming a good teacher.

Maturity

Even though the experiences of MAT and traditional teachers is generally similar there are a couple of differences. One of those differences is related to age or maturity. Many of the MAT teacher credit their success or their preparedness to being older and more mature. Jessica said, "...a part of that was I've had other careers in managing people and I was older. I wasn't a 21-year-old stepping into a high school classroom. I have a little more life under my belt...I do not think that 21-year-old me would have been a fabulous teacher." Joan agreed with her own statement, "I feel like I'm more equipped to teach because I've got some life experience behind me. I'm a little bit older than a normal second year teacher would be." James stressed the importance of experience for new teachers, "Because I was older when I went through and did this, I was 31 to 33-ish. When you're talking about 19, 20-year-olds just starting out right out of high school, and they're in an education program they need to hear they need more experience, more experience."

As you can see, the MAT teachers, since most of them are older, credit this to some of their preparedness in the classroom. Sally gave us a glimpse of the opposite viewpoint as she shared her experience,

I think I was most unprepared for community and parent communication as an educator. Going into the work field and working with middle school aged students as a fresh 22-year-old I did have some parents that maybe didn't see me as a professional. They would be fine over email communication. Then they'd walk in during conferences, and were like, oh my gosh, are you old enough to be a teacher? You look like my child's age. That created some boundaries that were

difficult to break down. I felt like I was constantly trying to prove my worth, and I was the only new hire straight out of college that my district had had in a while and has had since then. So, I'm still one of the youngest in my group of teachers. That's definitely had an impact on the kind of communication skills that I've had to develop with community members that maybe view my input as a new way of teaching. I'm not coming from a structured background that they feel like they necessarily have had. Talking with parents, sometimes is getting better now that I'm aging. But I felt like parents originally didn't see me as an equal adult, rather as a young adult that may or may not actually know what I was talking about. So, I think that was an area that I struggled trying to make sure that people knew that I am a professional. I know what I'm doing.

In Sally's story you can see her struggle as she had to combat discrimination from some parents due her age even though she is a fully trained, capable, and qualified educator.

RQ2: How do graduates of the MAT and traditional programs perceive their preparedness to teach?

Research question number two also showed the perceptions I reported were similar for traditional and MAT graduates. They reported that any experience was beneficial when entering the classroom even if it was not directly related to content. These non-content experiences were beneficial in developing intangible skills such as communication and relationship building. Furthermore, teachers who reported being parents shared that the experience with their own kids influenced them positively in relating to kids in general. Most teachers thought that the workload was a concern but due to other professional experiences, MAT teachers seemed better prepared for the time

commitment. Finally, mentors and peers were very helpful to new teachers adjusting to the classroom but there are situations in which the quality of mentor cannot be controlled.

Experience Benefits

First, any professional or volunteer experiences outside of traditional education proved to be of benefit. Steven discussed the benefits of sports,

Leadership all came from sports. I had a couple of part-time jobs that I would work in the summers or every Christmas break. I don't know if those helped me in the classroom. It's probably more the relationship side. I always took time to build relationships with my teachers, coaches or my managers, etc., and that probably helped in school when I had to interact with other(s)...

Stewart recalled his experiences working at a fast-food restaurant,

I can remember the positive communications, especially at Chick-fil-A. I remember there are a lot of times when you're just learning to be relatable. The corporation encouraged you to try to get to know the person and try to figure out what makes them feel valued. And so, you would learn to look for things that they were wearing. Was that something that I could talk to them about? Finding these relational connections with other people translates directly to the classroom as well...

Intangible Benefits

Second, many of the benefits were not directly tied to the content of the course. Many of the experiences that respondents deemed helpful were directed at intangible skills such as communication and relationships. Scott explained how his time in the food industry prepared him,

I do think working in food service, surprisingly, was some of the most beneficial experiences that I had because it taught me how to think on my feet and talk with people. When you're working for tips you have to be able to engage with different people. So, I think that was my professional experience. But it helped me, especially in engaging with families and students. It just prepared me for a bunch of different situations and even difficult times if there were difficult parent phone calls. If I've been yelled at about pasta, I think I can handle someone who's having a difficult time with their child. That seems a bit more serious. I was prepared for those difficult conversations after working food service.

Jennifer volunteered to work with a youth drumline, which helped prepare her.

It really helped me gain an understanding of how they think and how they function. And so being able to do it, not necessarily every day, because drumline was just a couple nights a week, but it was already getting to work with high school students.

Parenting Helped

Third, respondents who identified as being parents indicated that the experience of being a parent helped them. Jane explained how being a parent helped, “Now as a teacher parenting, being a parent first I think has been incredibly helpful... I mean, it's hard to say I'm a parent, so I think that that lends itself to help more so than the courses that I was taught, if that makes sense.” Joan also thought parenting was beneficial, “The mom comes out a lot because I have three boys of my own... I feel like being a mom prepared me more for classroom management than necessarily a specific class that I took at school.” Shirley shared her thoughts on parenting and teaching,

I think when you like me, I went into the classroom as a mom, so I had a little bit of a mindset of like, how would I want my teacher or my daughter's teacher to treat her? So, I felt like that kind of helped me guide how I taught my classroom and how I handled things.

James also shared about parenting, “I had a child by then. I feel, even with a young child, seeing things, seeing strategies that work for behavioral issues and calming them down or motivating them can also work at a high school level. So, I brought those into it.”

Workload Concerns

Lastly, many of the teachers indicated workload as a concern but MAT teachers were more comfortable with the demands. Jennifer said, “I was working for many hours trying to get it prepared and ready for the week. I think if I struggled with something, that would probably be the biggest one.” Stewart recalled his time as a new teacher,

So unprepared for the amount of workload that a teacher must carry out. In year one had many, many, many, many late nights where I would work off the clock unpaid to accomplish what was supposed to be occurring throughout the day. But there just wasn't the time. I wasn't prepared for that.

There was sentiment with a couple of MAT teachers that the workload was part of the job. Joan discussed how she related the work to previous experiences,

I've already had a different job, which was also a salaried position. So, it didn't matter how many hours I worked, whether it was more or less than the standard, 40-hour workweek or whatever. This is your salary so do this job. So, you need to make sure you do this job. I just feel like that gives me a different mindset when it comes to teaching.

Jane described her appreciation of the job and the time commitment,

I think working in small businesses for a lot of years made me appreciate the job.

I think a lot of teachers get very negative to the profession. We don't get paid enough; we don't have enough time. I just kept thinking this is the highest I've ever gotten paid. And I get the whole summer off. I feel like having a life experience somewhere prior helps me be a more productive employee.

Mentoring Helped

Most teachers reported that when they felt unprepared or needed some help they had a strong and positive connection with a mentor in their building whether it be a formal mentor or simply a peer. Sara responded, "...the biggest help was the instructional coach, my mentor teacher. Still talking to just my regular coworkers, really, really helped." Sally recalled getting help from her mentor,

The mentor that I was set up informally, was a math teacher down the hallway, and she was an amazing resource. Her experience that she'd been at the district just a little bit longer than me was significant in helping me kind of get my bearings on things...

Jessica also reported a positive mentor experience,

I worked two years with a veteran teacher...because every school district has their own unique ins and outs and policies. As a newbie, you might not understand. I thought that the mentor program at the district was really good.

However, not all mentorships have the same results. Sheila and Joy both discuss having mentors that did not teach the same subject. Joy felt that, "There was no mentor because I was the one and only business teacher." Sheila also expressed disappointment

that, “No, the middle school did not. They had teams.” A mix of subject area teachers. Joy further goes on to describe a situation where the mentor was not interested in helping, “I remember that lady from that school. I think her words were something like, don't bother me. I'm your mentor. I'll check in with you when I want to.”

RQ3: How do graduates of the MAT with prior work experience and traditional program graduates perceive their comfort in classroom management, content, and pedagogy?

For research question number three, in line with the literature and among both groups, the results were similar. Most felt very comfortable with the lesson planning, curriculum and content aspects of teaching. Classroom management was by far the area that most attested to struggling when first entering the classroom. There were a couple of MAT teachers that contradicted that trend and explained that they had experiences before becoming educators that prepared them for this challenge.

Lesson Planning

In terms of lesson planning, participants felt possibly overprepared. Sam described how he felt in relation to lesson planning:

I felt completely prepared with lesson planning and actually almost over-prepared for lesson planning, because of the stuff that I learned at the University of Central Missouri... formal lesson plans and all of that weren't all particularly required in the district that I worked at. So, I felt over-prepared.

Sally shared her experiences with lesson planning that first year:

We would write out lesson plans. They were not necessarily structured lesson plans like filling out a worksheet or a template. We would focus on the steps that

we were going to complete, more like a bullet point list. Then we would put in little bits of details where we felt like we might need a reminder and then we also associated that with the amount of time it was supposed to take. Doing that heavily transferred over and helped me significantly with my first-year teaching.

Curriculum

Curriculum was an area with mixed reports but mostly positive, especially if there was a good curriculum in place already. Sally shared how she was mostly comfortable with curriculum,

Initially, going into my career in education, I think that I had a really good understanding of textbook curriculum in the sense that, like, I knew how to read curriculum. I knew how to structure it and create it and derive a lesson plan, but I struggled a little bit with the implementation.

Joy felt comfortable because the curriculum at the state level was well developed. She stated,

Well, curriculum wise, I have I've always said I was fortunate that I entered teaching at a time when DESE and the DESE business and marketing department were very strong. They had a curriculum for each of the subjects I was teaching... the others were jealous. They were like, all you had to do was go pull that up? And I'm like, it was right there. So, I felt supported by that.

Classroom Management

Classroom management was, by far, the biggest struggle for most, although a couple of MAT teachers reported that they did not struggle as much with classroom

management due to their past experiences. Sara reported, “I felt woefully unprepared. Horribly, horribly.” Shirley responded,

I don't feel like anyone's ever really prepared to go into a classroom. No matter how many times you talk about classroom management. I mean, until you really get hands-on control of your own classroom, I don't really think anyone's prepared to walk into a classroom.

Scott also found it difficult to prepare before you actually get into the classroom.

I think that's probably what I struggled with the most. But I think that's also such a hard thing to do. I feel like I knew my philosophy, I knew what I wanted to do, but really, until you're in the classroom and until you're in that situation with the kids, you have to be malleable.

MAT Classroom Management

A couple of MAT teachers did however report feeling comfortable with classroom management due to previous professional experiences. Joy commented,

...coming from the business world, that clicked with me because I knew there were procedures to do everything, you know, in a business. So that I followed those methods and that really helped me in the beginning with classroom management.

Jessica cited her previous business experience as an advantage when she shared, “Very prepared. But again, a part of that was I've had other careers in managing people and I was older. I wasn't a 21-year-old stepping into a high school classroom. I have a little more life under my belt.”

Implications

After examining the results of the research there are several improvements that could be made to help future educators. When examining recruitment or enrichment for future educators, admissions and programs should stress the importance of extracurricular and job experiences of any kind. Outreach for aspiring educators should promote experiences that develop intangible skills and not focus strictly on education or content.

Teacher preparation programs should strengthen observation and student teaching components. This could prove difficult especially for the MAT program, as many educators work as classroom teachers while simultaneously completing the student teaching requirement. It also has been impacted by emergency licensures and COVID restrictions, where many teachers enter the workforce before completing the student teaching experience or a significant number of observations.

If possible, observations should occur from the beginning and continue throughout the program. Teaching candidates could be required to visit a variety of classes, grade levels, and districts through course requirements. Student teaching for those not working as a classroom teacher, should occur in more than one environment and should be varied by district, demographic, and subjects or grade levels.

Teacher preparation should focus more on application and less on theoretical knowledge to better align with the expectations of new teachers. Courses should be teacher-specific and examine how to teach the content over just learning the content. The skills learned should be more aligned with what teachers will actually be using on a daily basis. For example, it is ok to teach a well-researched and defined lesson plan but then use this as a guide to develop practical lesson plans. Ensuring that the everyday style of

lesson planning meets the requirements and intent but in a more compact and applicable form.

The university should seek to strengthen the experience of curriculum alignment among teaching candidates by providing a curriculum share database for educators. Teachers in the teacher preparation program would learn the skills to develop curriculum while maintaining the database. Graduates would have access to links and access to a rich curriculum that has already been aligned to the state standards for various courses. It would include the essential standards, learning targets, and suggested activities already aligned to the state standards for a particular course. This would alleviate much of the stress and workload on new educators.

Other stakeholders could also benefit from this curriculum sharing. School districts would benefit by not having to invest in their own curriculum development. All teachers and students would benefit from a well-designed curriculum that allows teachers to focus on learning and implementation rather than curriculum development. A well-defined and aligned curriculum services all stakeholders.

The university could further this concept by assisting regional schools with resource alignment. After developing the curriculum share, resources still need to be connected with the learning objectives. Teachers must learn this skill in their preparation so why not have them work on actual schools that need alignment so that everyone benefits? Teacher candidates could learn all the curriculum development skills and develop a better understanding of individual curriculums while creating the very curriculum they may be using when they get to their first job.

The state of Missouri requires school districts to provide a mentor to new teachers and for completion of the Beginning Teacher Assistance Program objectives within the first two years in the classroom. Most teachers reported positive benefits from some form of mentoring, be that a formal mentoring program or just peer connections. However, the quality of the mentor cannot be guaranteed in each scenario. Smaller schools may not have another teacher in a similar content area or available at the same time due to scheduling.

UCM does bring back graduates for a one-day networking check-in with their graduated teachers. It would be worth expanding this support system for recent graduates after they move into their first years of teaching. A place where teachers in their first couple of years can reconnect with other first year teachers, especially if they are from smaller schools or need after-hours support on those late nights, could be created. This could take several forms, based upon what the students show interest in. Possibilities include a Facebook group, perhaps by topic area or even a peer or faculty monitored support group. This could work in correlation with the Curriculum Share concept previously proposed. This could serve as a form of assistance for those late nights where many new teachers are left alone to figure it out.

Further Research

Several key areas lend themselves to further exploration. First, it would be interesting to explore the differences between the teachers' experiences during their first year and second year of teaching. Second, while searching for study participants it appeared that many who were certified were not currently teaching. These licensed but not teaching educators should be given a voice. Third, non-STEM teachers' experiences

could be studied, as the MAT reaches beyond the STEM fields. A fourth study could compare the attrition rates of traditional path teachers as compared to MAT teachers.

Conclusion

The MAT and traditional teacher preparation program at UCM can both provide a solution to a lack of educators if more people would enlist in such programs. Even though both groups shared similar experiences and needs, the MAT teachers had the benefit of maturity and experience. Improving either program comes down to making experiences authentic to what teachers will see once in the classroom. Supporting new teachers can also be improved beyond a traditional mentor program through shared curriculum and facilitated networking. It is up to us to attract more teachers regardless of preparation program and to provide better support in their first few years to attract and retain new educators.

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SECTION VI: SCHOLARLY PRACTITIONER REFLECTION

As I look back on the journey that I hope will ultimately end with my completion of this dissertation and earning my Doctorate of Educational Leadership, it is difficult to extract simply how I have changed as an educational scholar and practitioner without recognizing that I have changed as a person through this process. I think inherent in any transformational process there are ebbs and flows, peaks and valleys as you will. There were times when things went smoothly and times when the goal did not seem achievable. I think that I grew just as much as a person along this journey as I did within my profession.

There have been many people before and many more to come who will complete a journey to reach the same pinnacle. However, someone once said it is about the journey and not the destination. I think along this journey we will all have our own unique experiences that make us stronger through our diverse learning path. I will try to relate to you the captivating nuggets that I stumbled upon on my journey as you read this reflection.

Influence Practice as a Scholar

My journey started a long time ago in a state far, far away from where it is ending. At one point I thought my journey had ended before achieving the goal I set out to accomplish so many years ago. Let me start at the beginning so you can understand the path that I took and gain an appreciation for the lessons I had to learn along the way.

Like the MAT graduates in this study, teaching was not my first career. Originally, I was a process engineer who worked to control manufacturing processes for quality and efficiency. Continuous improvement and logic driven decision making is in my DNA. Luckily, I was able to find a job in a large school where I could teach Physics

the basis for all engineering all day, every day. Life was happy for a while but my training and thirst for improvement was not quenched. I started to see a larger picture of education and had ideas to improve the process.

It started with personal improvement to learn more about education and move up the pay scale. I took classes to earn an Education Specialist Degree in Administration. Although I didn't want to be an administrator, I now had more knowledge and skills to help improve education locally.

After completing that degree I thought, I still have educational funding through my military service so I might as well learn more and keep moving up the pay scale. Not to mention I was enjoying becoming a larger voice to drive change within my building. So, I decided I should do this doctorate thing.

The year was 2015. I had just finished my Ed Specialist and was accepted into the tenth cohort program. The next two years were a combination of weekly classes during the school year and a couple of intense weeks during the summer at the University of Missouri campus. There we worked with other professionals in the field of education from all over the state. We learned together and from each other. I was just devouring information and learning about different perspectives, life was glorious even if I didn't plan on using the information I couldn't get enough.

After completing the doctorate coursework, our family moved from Missouri to Alaska. I remember writing my doctoral comps until two in the morning and walking home watching the kids playing basketball because the sun never went down for three months. I actually put my administrative degree to work and was a busy new assistant principal in a town just north of the arctic circle. Life was busy and full of new experiences

and the time started to fly by without me thinking about the dissertation I needed to be working on.

After two years my position was reduced, and we moved to a small town on the road system in Alaska where I was a building administrator and classroom teacher. It was a busy time and Covid was all the rage. The dissertation seemed even less relevant. I had some health issues, life happens, and time was running out, so I conceded. It was over. What a relief.

One day the phone rang. It was one of my champions. Somebody who believed in me even when I did not. They told me I had an opportunity and I should not waste my ability and the effort I had already invested. With the support of my other champions, my wife and children, we agreed the commitment was worth it. I was able to appeal for an extension and I have since maxed out the generosity of the university and I appreciate them seeing the potential in me as well.

There I was back on track. I may have been on the wrong train, but I took off with renewed vigor. I absolutely loved listening to the stories of fellow educators and learning from their experiences. However, getting participants was difficult and the project got stalled. With some help and support from connections at the university and my champion advisor we found just enough. Delayed but on the right train now but still running out of time.

Which leads me to where I am at writing this reflection. I have been pulling late nights almost every night. Working on the weekends when we all want to be doing other things. Making that sacrifice to complete this goal. Not sure of what I should be writing but knowing that I have a story to tell. A story about change and growth and what it takes

to be a scholar and a leader. I am not sure what you will learn from my story but here is what I have learned.

The best learning we can do is from each other. Everyone has a story to tell if you are listening. I truly enjoyed hearing from other educators during this study and it has inspired me to take a more active role again in the educational community. It reminded me of the cohort model and the growth we all made as a group working for a common understanding. I started by assisting with the district PLC committee and recently got selected to work on the district Academic Advocacy Committee as well.

I have started listening more and paying attention to other's stories even if they are not speaking. In my classroom I am trying to learn about my students both through listening but also observing to understand their story and learn from them. In my school community I have been more open to hearing the truth people are speaking. Not focusing on negativity but on learning through shared experiences.

Unfortunately, the more I learn the more questions I have. If anything, this process has reinvigorated the drive to learn and analyze. Reflect and reform, continuously improve. It has taught me the value of truly listening to others.

I recently had a student who others had labeled as lacking motivation and a discipline problem, and they presented that way. It took a couple of months before I could get enough work from them and observe them to finally hear their story. They copied work very well but couldn't write their own answers, not even close. It took me advocating but finally got them tested because they told me through actions they couldn't read. That was the problem, but no one was listening to them and looking for deeper understanding.

From the practitioner side of things, obviously this study has some impact on how I would look at applicants for hiring. Teacher preparation and certification are important to teach in a specific field, but other experiences could be valuable and are worth a second look when evaluating candidates. However, just like the participants in this study who reported intangible benefits from their experiences, this process has affected me more than just practical applied learning.

Influence Practice as a Leader

It has caused me to reflect on leadership and what that means. Leaders are not born, they are cultivated. Which means they are a product of their environment as much if not more than those of which they are made. For example, plants in a garden have certain genetics but if they are not cared for they will not produce even if they have better genes. Whereas a lesser plant may flourish if given proper care.

I feel truly grateful that there were people there to recognize something within me that I had given up on. They encouraged me and supported me. This has caused me to look deeper than I ever have into others around me. I have always looked beyond the surface but never with the level of intent that I do because of my journey. I wonder how each student or coworker could be given the right direction or motivation to reach their maximum potential. I realize that not everyone can be good at all things but how can I identify and grow others to reach their hidden potential.

This journey has also allowed me to realize there is a lot of gray in leadership. As an engineer relying on logic and scientific data is the cornerstone of all decisions. In leadership there are lots of areas of uncertainty. Sometimes you must make the decision based upon the best data you have. In our design study we did not have all the

information we would have liked. We made a good decision that had to be made in the timeframe allotted. At the end we realized that we could have made a better decision if we would have known everything but if we would have waited the opportunity would have passed and nothing would have been successful.

We read several texts, such as Switch, during our doctoral coursework about affecting change. To get others to follow a leader cannot rely strictly on data and logic to get others to follow. People in general are resistant to change. To lead we must find the factors that motivate others beyond mere logic and reasoning. It is our job to learn what others find important and make those emotional connections. If you connect to their heart, you can lead their minds. Your mind alone will not change if your passion is set against it no matter what the logic says.

Change is difficult as a leader. You must motivate others, and you may not have all of the information. It is also difficult when you see the changes that need to be made but you must be patient. A mentor who worked with me during this journey said, constant slight change will get everyone to the goal whereas sudden change will build resistance.

I have also learned that even leaders must rely on others and that does not make them a weak leader. As a matter of fact, I now know that strong leaders recognize their shortfalls and align with others who can help bridge those gaps. No one person can be everything. It has taken many people to get me to this point and I appreciate the support knowing I could not have gotten this far without them.

One of the texts we studied talked about avoiding pitfalls such as sunk cost analysis. There are times when a leader must recognize when things are not working and realize when to cut the losses. This comes to people as well. There have been people

throughout this experience who I thought I could not do this without them due to their expertise or institutional knowledge. However, they also brought with them baggage that weighed down the system. What I learned was that cancer is a cancer. It is better to cut it out, you will find a way to solve the problems the void creates without the cancer killing you.

Overall, this leadership journey has been about self-exploration while learning to listen to the needs of others. I needed to slow down. Just because I can see what needs to happen and justify the outcome, leading people means finding a way to connect them together and apply the slow and steady pressure to guide them in the right direction. This applies to the classroom and coworkers alike.

I have realized that as a leader I am only as good as my team. I cannot do everything, and I need to recognize the needs of the group and utilize everyone's talents to support each other. I must recognize that we are all different and build community within. At times I will have to make decisions for the better of the organization but if the connections have been strengthened before the storm, we can survive. If we are trying to board windows during the hurricane we will probably just get blown away.

Lastly, I have realized that this is not the end. I dreaded finishing my dissertation and earning a doctorate because I was afraid that I would have reached the end. I was unsure of what would come after it was over. I have realized that this is the beginning. It has made me realize that I have learned so many valuable lessons that I can do more than I thought possible. It is up to me from here to find opportunities to take what I have learned and use it to benefit others.

I would like to sum this all up with an analogy from my childhood. I hope you remember silly putty but if you do not, please find some and put some silly in your life. It is a taffy like moldable substance that can be shaped easily, only limited by your imagination. A somewhat sticky pliable goo that comes in a plastic egg.

A leader is kind of like the whole silly putty experience. Leaders are like the egg and protect what's inside. We carry the messaging of what we are about on the inside and make promises about what you will get when you interact with our organization.

Once inside you will see the connections that the leader has created. Every piece becomes an integral part of the whole. They are each connected by some internal forces gluing them together. They can be separated but they are just two homogenous parts of themselves and can easily be put back together. The goal is to be flexible and fun and adaptable to the needs of the mission and they need each other to be at their best, the more putty the better.

Silly putty can be changed but if you go too fast it breaks apart. It can copy things like newspaper images, but it is just a copy until you blend it into the putty and it becomes part of itself. It can be filled with hot air but when put under pressure it bursts because the air was hollow and not part of the putty itself.

Occasionally, something may get into the putty like a piece of hair. You don't want to pull it out because you will lose some of the putty, but it makes playing with it miserable and you consider the whole thing a failure because we have lost the fun. You finally realize that when you pull it out you did lose some putty but suddenly, the rest of the putty is just as good as it was before.

The best part about silly putty is if you mess it up, it is cheap to start over so don't be afraid. It is completely moldable only limited by your imagination of what you can accomplish with it as long as you go slow and don't fill it with empty promises. You can share it with friends and have a lot of fun.

This goal is not the end! I have a lot of silliness and "puttyness" to take with me on my future journeys as a leader. Thank heavens for the experiences that have molded me into who I am.

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APPENDIX A
TRADITIONAL COURSES FOR UCM TEACHING PROGRAM

Middle School-Junior High School, BSE (41-840)
- General Science Subject Area

- [STCH 1003 - Great Concepts in Science GE \(4: 3 lecture, 1 lab\)](#)
- [EDFL 2100 - Introduction to the Teaching Profession \(3\)](#)
- [FLDX 2150 - Introductory Field Experience \(1\)](#)
- [EDFL 2240 - Educational Psychology GE \(3\)](#)
- [EDSP 2100 - Education of the Exceptional Child \(3\)](#)
- [EDFL 2250 - Introduction to English Language Learners and Culturally Responsive Pedagogy \(2\)](#)
- [STCH 3020 - Science and Engineering Practices GE \(3\)](#)
- [EDFL 3230 - Introduction to Language, Literacy and Literature in the Middle Level Classroom, Block One \(4\)](#)
- [MLED 4130 - Fundamentals of Middle Level Education \(4\)](#)
- [EDFL 3240 - Application of Content Area Literacy for Middle Level Learners, Block Two \(4\)](#)
- [MLED 4135 - Middle Level Curriculum and Assessment \(4\)](#)
- [CFD 1220 - Child and Adolescent Development \(3\)](#)
- OR
- [PSY 2220 - Child and Adolescent Psychological Development \(3\)](#)
- OR
- [PSY 3220 - Life-Span Development \(3\)](#)
- [STCH 4010 - Exploring Firsthand Science Lessons \(1-2\)](#)
- [MLED 4340 - The Engaging Middle Level Classroom \(4\)](#)
- [STCH 4050 - Science Teaching Methods \(3\)](#)
- [FLDX 4497 - Student Teaching Middle School I \(1-12\)](#)
- [FLDX 4498 - Student Teaching Middle School II \(1-12\)](#)

Secondary Education, BSE (41-695) - Biology Option (E487)

- [EDFL 2240 - Educational Psychology GE \(3\)](#)
- [PSY 2220 - Child and Adolescent Psychological Development \(3\)](#)
- OR
- [PSY 3220 - Life-Span Development \(3\)](#)

Professional Education: 37 Semester Hours

- [EDFL 2100 - Introduction to the Teaching Profession \(3\)](#)
- [EDFL 2240 - Educational Psychology GE \(3\)](#)
- [EDFL 2250 - Introduction to English Language Learners and Culturally Responsive Pedagogy \(2\)](#)
- [EDFL 4210 - Introduction to Content Area Literacy \(2\)](#)
- [EDFL 4212 - Literacy in the Disciplines I \(2\)](#)
- [EDFL 4970 - Secondary Teaching and Behavioral Management \(2\)](#)
- [EDFL 4972 - Literacy in the Disciplines II \(2\)](#)
- [EDFL 4973 - Classroom Management in Content Areas \(1\)](#)
- [EDFL 4974 - Content Specific Assessment \(1\)](#)
- [EDSP 2100 - Education of the Exceptional Child \(3\)](#)
- [FLDX 2150 - Introductory Field Experience \(1\)](#)
- [FLDX 3000 - Field Experience in the Content Area \(1\)](#)
- [FLDX 4970 - Field Experience II in the Content Area \(1\)](#)
- [STCH 4010 - Exploring Firsthand Science Lessons \(1-2\) \(1\)](#)
- [STCH 4050 - Science Teaching Methods \(3\)](#)

Student Teaching Semester: 12 Semester Hours

- [FLDX 4468 - Student Teaching Secondary II \(1-12\) \(4\) 10](#)
- [FLDX 4595 - Student Teaching Secondary I \(1-12\) \(4\)](#)
- [STCH 4080 - Science Learning and Literacy \(4\)](#)

Secondary Education, BSE (41-695) - Mathematics Option (E459)

- [EDFL 2240 - Educational Psychology GE \(3\)](#)

Professional Education: 42 Semester Hours

- [EDFL 2100 - Introduction to the Teaching Profession \(3\)](#)
- [EDFL 2240 - Educational Psychology GE \(3\)](#)
- [EDFL 2250 - Introduction to English Language Learners and Culturally Responsive Pedagogy \(2\)](#)
- [EDFL 4210 - Introduction to Content Area Literacy \(2\)](#)
- [EDFL 4212 - Literacy in the Disciplines I \(2\)](#)
- [EDFL 4970 - Secondary Teaching and Behavioral Management \(2\)](#)
- [EDFL 4972 - Literacy in the Disciplines II \(2\)](#)
- [EDSP 2100 - Education of the Exceptional Child \(3\)](#)
- [FLDX 2150 - Introductory Field Experience \(1\)](#)
- [FLDX 3000 - Field Experience in the Content Area \(1\)](#)
- [FLDX 4970 - Field Experience II in the Content Area \(1\)](#)
- [MATH 4880 - Issues and Methods of Teaching Secondary Mathematics \(3\)](#)
- [MATH 4973 - Engaging Secondary Mathematics Learners \(1\)](#)
- [MATH 4974 - Assessment in the Mathematics Classroom \(1\)](#)
-
- [CFD 1220 - Child and Adolescent Development \(3\)](#)
- OR
- [PSY 2220 - Child and Adolescent Psychological Development \(3\)](#)

Student Teaching Semester: 12 Semester Hours

- [FLDX 4468 - Student Teaching Secondary II \(1-12\) \(6\)](#) ¹⁰
- [FLDX 4595 - Student Teaching Secondary I \(1-12\) \(6\)](#)

Secondary Education, BSE (41-695) - Engineering and Technology Teacher Education Option (E282)

- [EDFL 2240 - Educational Psychology GE \(3\)](#)

Professional Education: 46 Semester Hours

- [CTE 4145 - Curriculum Construction in Career and Technical Education \(3\)](#)
- [EDFL 2100 - Introduction to the Teaching Profession \(3\)](#)
- [EDFL 2240 - Educational Psychology GE \(3\)](#)
- [EDFL 4210 - Introduction to Content Area Literacy \(2\)](#)
- [EDFL 4212 - Literacy in the Disciplines I \(2\)](#)
- [EDFL 4970 - Secondary Teaching and Behavioral Management \(2\)](#)
- [EDFL 4972 - Literacy in the Disciplines II \(2\)](#)
- [EDSP 2100 - Education of the Exceptional Child \(3\)](#)
- [FLDX 2150 - Introductory Field Experience \(1\)](#)
- [CFD 1220 - Child and Adolescent Development \(3\)](#)
- OR
- [PSY 2220 - Child and Adolescent Psychological Development \(3\)](#)
- OR
- [PSY 3220 - Life-Span Development \(3\)](#)
- [CTE 4973 - CTE Classroom and Lab Management Techniques \(1\)](#)
- [EDFL 2250 - Introduction to English Language Learners and Culturally Responsive Pedagogy \(2\)](#)
- [FLDX 3000 - Field Experience in the Content Area \(1\)](#)
- [CTE 4160 - Methods of Teaching Career and Technical Education \(3\)](#)
- [CTE 4974 - Educational Evaluation and Strategies \(2\)](#)
- [FLDX 4970 - Field Experience II in the Content Area \(1\)](#)

Student Teaching Semester: 12 Semester Hours

- [FLDX 4468 - Student Teaching Secondary II \(1-12\) \(6\)](#) ¹⁰
- [FLDX 4595 - Student Teaching Secondary I \(1-12\) \(6\)](#)

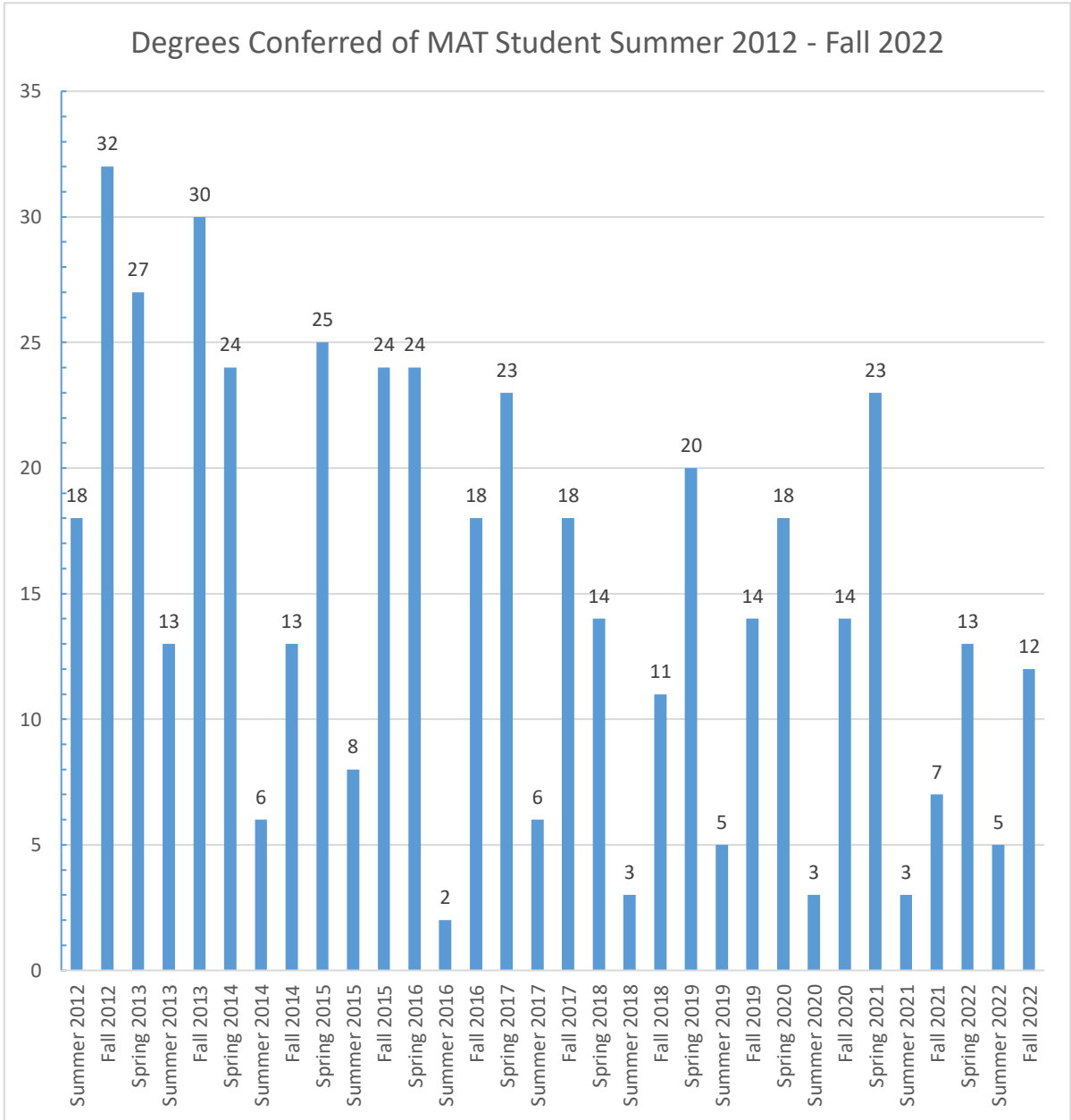
(University of Central Missouri Catalog, 2023)

APPENDIX B UCM MAT PROGRAM COURSES

Course#	Course Name	EDFL 5105	ECEL 5120	EDFL 5130	ECEL 5140	EDFL 5200	EDSP 5200	EDFL 5208	EDFL 5209	EDFL 5270	EDFL 5300	EDFL 5330	EDFL 5340	ECEL 5400	EDFL 5440	ECEL 5890	EDFL/ST CH 5900	5100/5468
		X				X		X	X	X	X	X	X				X	X
Secondary Education (8002)																		
		X				X		X	X	X	X	X	X				X	X
Middle School Education (8001)																		
		X				X		X	X	X	X	X	X				X	X
Elementary Education (8004)																		
		X				X		X	X	X	X	X	X				X	X
K-12 Education (8005)		X				X		X	X	X	X	X	X				X	X
Science Education* (8006)		X				X		X	X	X	X	X	X				X	X

Educational Theory (8003) degree program not included
*Additional Courses Specific to Science Education Program: STCH- 5010 Exploring Firsthand Science Lessons, 5020 Internship in Science Teaching and Learning, 5050 Science Teaching Methods

**APPENDIX C
DEGREES CONFERRED OF MAT STUDENT SUMMER 2012-FALL 2022**



(C. Plummer, personnel communication, February 16, 2023)

APPENDIX D

Interview Questions

1. Why did you become an educator?
2. How long have you been teaching?
3. What subject have you taught and currently teach?
4. What grade levels have you taught and what grade levels do you currently teach?
5. How prepared did you feel in terms of _____ in your first couple years of teaching?

Content/Classroom Management/Pedagogy

6. What areas did you feel unprepared?
7. What courses or experiences at your college/university best prepared you for teaching?
8. Where did you feel the most prepared? Least prepared?
9. What life experiences helped you feel prepared for the classroom?
10. What professional experiences benefited your preparation for the classroom?
11. Did you have any other professional or personal experiences that benefited your preparation for the classroom?
12. How did these experiences help you in the classroom?
13. If you felt unprepared for a situation in the classroom, how did you overcome it?
14. What would you have done ahead of time to feel more prepared as a teacher?
15. What recommendations would you make for preparing future teachers?
16. What do you see yourself doing in 1 year? 5 years? Future?

VITA

Tim Wieland was born and raised in the upper peninsula of Michigan. His parents raised five children, two older sisters and two younger nephews. Both parents retired from the school district where he received his preK-12 education. His dad was a bus driver and then head mechanic at the school bus garage. His mother drove a school bus and worked in various other positions within the schools.

Tim stayed in the upper peninsula and earned a Bachelor of Science in Mechanical Engineering from Michigan Technological University. Tim worked as a contract engineer at General Motors in the lower peninsula and eventually moved to Missouri to work at an engine remanufacturer in Kansas City. He left the field of engineering due to health concerns.

Eventually he met the love of his life a Missouri farm girl and he carted her away for a stint in the US Army working on helicopters. After getting injured he left the service and headed back to the farm in Missouri. There he pursued his teaching credentials through the MAT program at the University of Central Missouri.

Tim spent the next 10 years raising animals and two boys, while teaching science in several districts, mostly in Lee's Summit, Missouri. He completed his Education Specialist degree in Administration from UCM and completed his coursework for the doctorate program.

Eventually the family headed north of the arctic circle on an adventure where Tim worked as an assistant principal. Tim currently works as a science teacher teaching his favorite subject, Physics, and is looking to get back into administration. His lovely wife is a PreK teacher and very forgiving. The family now resides on the road system and is enjoying the outdoors of Alaska.