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Challenges for Beginning Secondary Technology Education Teachers

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Abstract

Objective: The purpose of this study was to describe challenges faced by beginning technology education (TE) teachers in [state]. **Background:** The highest attrition rates are among beginning teachers and with a continued shortage of TE teachers, identifying the problems new teachers encounter need to be identified for retention and the sustainability of the TE profession. **Method:** A qualitative research design using an online questionnaire was completed by 27 [state] TE teachers who had taught four or fewer years. **Results:** Qualitative analysis revealed four themes: facility management, student management, external relations, and instruction management. Each theme contained subthemes; the predominant subthemes were equipment and funding. **Conclusions:** By adequately preparing TE teachers at the pre-service and entry levels to handle potential problems, the profession can increase job satisfaction and reduce teacher attrition in efforts to eradicate the TE teacher national shortage. **Application:** Implications for TE teacher education programs, administration, and professional development are discussed. **Keywords:** Technology education teachers, teacher education teacher problems, beginning teacher problems, career and technical education teacher challenges

Industrial occupations, also known as technology education (TE), and part of the science, technology, engineering, and mathematics (STEM) career cluster, was identified as a teacher shortage area in many states for the 2017-2018 school year (Cross, 2017). This was not a new problem for this Career and Technical Education (CTE) content area. A decade and a half ago, Wicklein (2004) reported that the most pressing problem facing the profession was insufficient supply of available TE teachers. This persistent need for TE teachers was related more to preretirement teacher turnover than to retirements (Ingersoll & Perda, 2010). Clandinin and Long (2015) reported that attrition was most prevalent among beginning teachers. Thus, identifying the challenges faced by “early career” teachers needed to be identified for the sustainability of the TE programs.

Boone and Boone (2017) reported many new teachers leave the profession because of the number and types of problems faced in their teaching assignment. However, little evidence exists on the retention and concerns of beginning TE teachers. Therefore, the purpose of this study was to describe challenges faced by beginning TE teachers in [state]. An understanding of problems facing beginning TE teachers is a critical first step for TE professionals and school administrators seeking to improve the retention rates of novice TE teachers, to find solutions to keep those TE teachers in the classroom and eradicate the shortage.

Review of Literature

Teaching in the CTE discipline, of which TE is a service area, is a rigorous yet frequently underrated challenge (Cushall, 2002). This has been evidenced by the attrition rates of beginning teachers. In general, nearly 25% of new teachers leave the profession within the first three years and 50 – 60% of new teachers resign within the first five years (Tamberg, 2007). Osgood (2001) referred to the induction phase as the most critical facet related to remaining or exiting the profession. The induction phase, which follows pre-service, has been characterized as the time for the new teacher to integrate into the professional and social culture of a school, school district and community (Fessler & Christensen, 1992). This is the time that the teaching candidate truly becomes the educational professional (Fessler & Christensen, 1992). New teachers are exposed to the reality of the profession, for which even the best teacher preparation programs are unable to provide authentic representations (Odell, 1987).

Teaching is one of the few professions in which beginning teachers have as much responsibility as their experienced colleagues (Tait, 2008). Huberman (1993) proposed that the first three years were a time of beginnings for teachers feeling their way as new professionals. However, beginning teachers are expected to perform at the level of veteran teachers. Because novice teachers experience a reality shock when confronted with the demands of teaching, many feel ineffective and overwhelmed (Bennett, Iverson, Rohs, Langone, & Edwards, 2002). Croasmun, Hampton, and Herrmann (1999) cited one reason so many new teachers leave was that the [teaching] profession has been slow to develop a systematic way to induct beginners gradually into the complexities of a job that demands hundreds of management decisions every day. Research focused on the beginning teacher experience found copious evidence to show that the transition from education student to professional teacher was often a difficult and stressful experience and one that was frequently associated with an early exit from the profession (Kelchtermans & Ballet, 2002; Schonfeld, 2001).

Teacher attrition has been linked to a multitude of problems faced by beginning teachers in their teaching assignment. Daresh (2003) categorized the major concerns of beginning teachers into three groups:

- management concerns;
- personal concerns; and
- instructional concerns.

Veenman (1984) conducted a thorough examination of educational research and identified 91 studies that involved early career teacher concerns. Within these studies, the most frequently reported problems for beginning teachers were classroom management and discipline, motivating students, insufficient supplies, insufficient preparation time due to high teaching loads, and relationships with colleagues. Other problems identified as reasons for leaving the teaching profession included:

- time management;
- facilities and equipment;
- working with special populations;
- budgets and funding;

- salaries;
- curriculum development;
- student motivation; and
- lack of administrative support (Boone & Boone, 2007; Hughes, 2012; Ingersoll, 2003; Myers, Dyer, & Washburn, 2005; Stair, Warner, & Moore, 2010; Steinke & Putnam, 2007; Zirkle & Winegardner, 2007).

Particular to TE educators, limited research exists on beginning teachers' initial challenges, however there is some literature, although dated on challenges facing the TE teaching profession. Wicklein (1993, 2004) and Lazaros and Rogers (2006) indicated the problems facing the profession were lack of understanding by the general public, lack of consensus of curriculum content for TE, teacher resistance to changes within TE, inaccurate understanding and support of TE by administrators and counselors, increased graduation requirements impacting TE programming, and inadequate financial support for TE. Other challenges reported by Lee (2009) included outdated image, lack of parental support, and weak relationships with peer teachers. Most recently, Arnett-Hartwick and Cannon (2019) identified 26 challenges for TE teachers with equipment and funding being the top two across all categories of teaching experience. Although some research exists of the problems among TE teachers, it is not clear whether beginning TE teachers experience the same challenges as other levels of experience.

Induction programs have been used as a strategy to support and mentor beginning teachers. While many induction issues for beginning teachers were similar across disciplines, it can be debated that there are unique elements associated with being a CTE teacher (which TE is a part) that may require different mentoring strategies (Greimann, Torres, Burris, & Kitchel, 2007). In fact, research has shown that often induction programs are a one-size fits all approach and not responsive to the unique needs of CTE teachers (Croasum, Hampton, & Herrmann, 1999).

Theoretical Framework

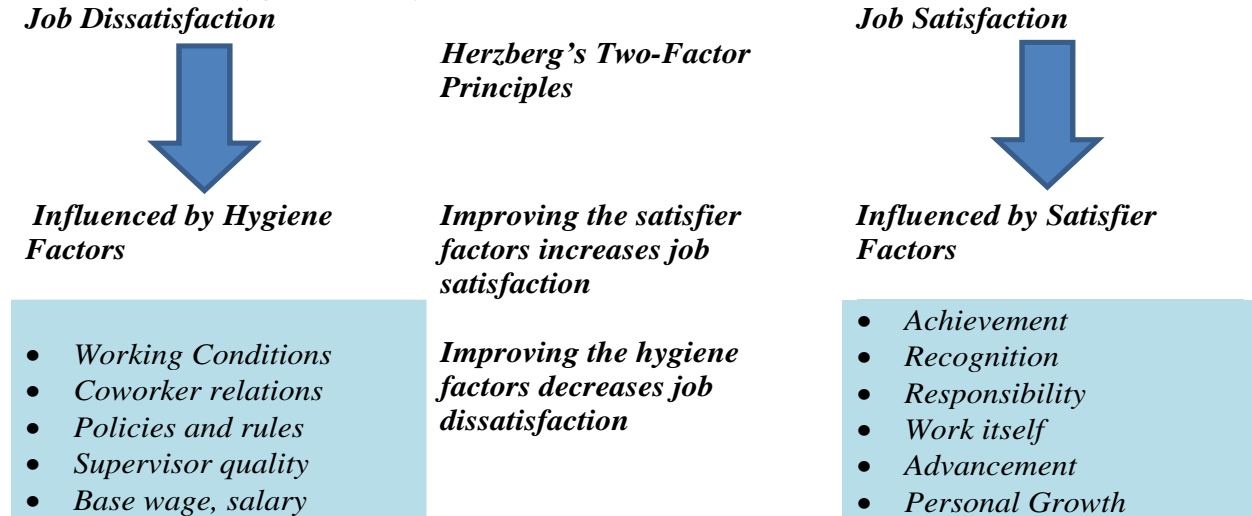
Career satisfaction has been a determinant of a teacher's decision to remain or leave the profession (Ubom & Joshua, 2004). Previous research indicated novice teachers expressed strong dissatisfaction as the primary reason they left their jobs due to problems within their teaching assignment (Voke, 2002). Self (2001) suggested that teachers resolve the question of whether to remain in education through "satisficing" rather than through optimizing. That is, the level of satisfaction is the rationale basis for a teacher leaving as opposed to trying to improve the situation.

The theoretical framework that has guided research related to job satisfaction primarily focused on intrinsic and extrinsic factors. Garton and Robinson (2006) stated that the Motivation-Hygiene Theory centered on intrinsic and extrinsic factors could explain why teachers identify with certain employability skills needed and why they leave their positions.

Herzberg (1966) developed the Two-Factor Theory of Job Satisfaction, also known as the Motivation-Hygiene Theory. The central tenet of this theory was that job satisfaction and job dissatisfaction were influenced by two substantially different sets of work-related factors termed "motivator" and "hygiene". Motivators are intrinsic factors of work while hygiene (maintenance) factors refer to extrinsic factors. Figure 1 illustrates some of the motivation

(intrinsic) and hygiene (extrinsic) factors that have been reported to influence job satisfaction or dissatisfaction among teachers.

Figure 1. Model for Herzberg's (1966) Two-Factor Theory of Job Satisfaction also known as the Motivation-Hygiene Theory.



The Motivation-Hygiene Theory operates on two mutually exclusive continuums. The job satisfaction continuum is impacted by motivator (intrinsic) factors and varies from a level of satisfaction to a level of no satisfaction. On the other hand, the job dissatisfaction continuum is impacted by hygiene (extrinsic) factors and operates from a level of dissatisfaction to a level of no dissatisfaction. Both the motivator and hygiene factors, however, may prove to facilitate negative experiences in the classroom (Arnett-Hartwick & Cannon, 2019).

As applied to this study, if beginning TE teachers encounter challenges due to a lack of preparation and/or competency [in problem areas], they may be less likely to be engaged with their work environments, grow professionally, or continue their interest in their jobs. If so, as a result, it is more likely they will leave the teaching profession and seek alternative types of employment due to dissatisfaction of the job (Berns, 1990). For example, a TE teacher has concerns for potential program cut, his/or her focus would be on job instability, a hygiene factor, that would push to the negative end on the dissatisfaction continuum, and ultimately may cause job dissatisfaction with perhaps a voluntary exit from teaching and enter the industry workforce. Therefore, since job satisfaction is determined by intrinsic and extrinsic factors, understanding these categorical factors among beginning TE teachers can prove beneficial for persistence in this career path.

Method

Purpose

The purpose of this study was to describe challenges faced by beginning TE teachers in [state]. The primary objective was to identify and categorize a list of challenges encountered by TE

teachers during their first years in the education profession. This study was guided by the following research question: what were the problems faced by beginning TE teachers in [state]?

Method and Procedures

A qualitative research design was selected to examine the phenomenon in detail and allow the respondents to describe the situations in their own words (Ary, Jacobs, Razavieh, & Sorensen, 2006). IRB approval was received from the primary researcher's university before the study began. The population consisted of beginning TE teachers employed in [state] during the 2018-19 school year. The sampling frame was established using the state's secondary TE teacher directory, and the entire population was studied.

A questionnaire adapted from Boone and Boone (2007) was used for this study. The questionnaire consisted of one open-ended question that asked respondents to describe two problems they encountered as beginning teachers in TE. For this study, novice teachers were defined as teaching for four or fewer years. The questionnaire was placed online using Qualtrics.

A cover letter that included the questionnaire link was emailed to every teacher in the accessible population. They were given one week to complete the questionnaire. Two subsequent weekly emails were sent to remind respondents to participate in the research study, as recommended by Dillman, Smyth, and Christian (2009). Twenty-seven respondents completed the questionnaire.

The response data from the open-ended question was divided into three stages for analysis. In stage one, the researcher transcribed the data. In stage two, the researcher and two other reviewers independently coded the data to establish themes and before discussing interrelated reliability was 95%; results were then compared for 100% consensus which established the trustworthiness of the data. In the third stage, the data was summarized and interpreted (Ary, Jacobs, Razavieh, & Sorensen, 2006).

Findings

The responses to the open-ended question on challenges encountered as a beginning TE were analyzed and four themes emerged. The four themes were (a) facility management, (b) student management, (c) external relations, and (d) instructional management. Each theme contained individual subthemes.

Facility Management

The facility management theme was cited as the most common identified problem area by respondents. Within this theme, there were two subthemes: (a) equipment and (b) funding. The most common response by beginning TE teachers was out-of-date or not enough equipment due to lack of funding. With regards to the equipment subtheme concerns, other examples included, "updating shop to keep with industry standards" and "maintaining equipment."

Funding was another subtheme within the facility management theme. Problem statements included, "needing to learn new technology with no monetary support," "purchasing supplies and develop working budgets," and "how to maximize materials based on a tight budget." One respondent commented, "inability to purchase the software and computer equipment needed to teach yet expected to have a quality program." Another respondent noted, "I had no idea about Perkins funding."

Student Management

The second theme was student management and included two subthemes: (a) discipline and (b) student motivation proved problematic for several respondents. Responses to the discipline subtheme included “finding the balance of being tough enough, but not too tough on students,” “classroom management,” and “dealing with inappropriate student behavior in labs.” Student motivation was a subtheme within the student management theme. Problem statements included “lazy students,” “a mixture of students who really want to be there and others who do not want to be there,” and “motivating students to do their best rather than settle for a D.”

External Relations

The third theme, external relations was noted by respondents as a problem area. Within this theme there were two subthemes: (a) image and (b) faculty relationships. Responses within the image subtheme were, “TE classes are a dumping ground for low ability students,” “guidance counselors not knowing the technical knowledge needed and enrolling students with very low math and/or reading ability,” and “having parents, students, counselors, and administration understand what TE is.” The other subtheme within external relations was faculty relationships. Responses included “academic teachers and administrators not understanding the academic application in TE,” and “feeling like an outsider to veteran teachers.” One respondent noted, “as a female TE teacher in a male dominated area, students and teachers were skeptical of my abilities.”

Instructional Management

The fourth theme was instructional management and included two subthemes: (a) variance with student abilities and (b) class preparations. Responses in the variance with student abilities included, “how to work with IEPs and 504 plans,” “not knowing how to teach differentiated learning with the large number of students, “teach to a wide range of ability from non-readers to AP students,” and “never assume a student can read a tape measure, start with the basics.”

Class preparations was the second subtheme within the instructional management theme. Problem statements included, “only TE teacher so I had to figure out it on my own,” “replacing a 40-year veteran teacher, walking into a program with no directive or curriculum materials,” “time for preparation,” and “more efficient with grading.” One respondent stated, “while in college, we had access to all the latest technology and instructors encouraged us to use the technology but in my first year of teaching that technology was not available.”

Discussion

The purpose of this study was to describe challenges faced by beginning TE teachers in Illinois. Qualitative results revealed four themes:

1. facility management;
2. student management;
3. external relations; and
4. instructional management.

Each theme contained individual subthemes. Most of the challenges described have been reported in previous studies as problems more broadly among teachers. The findings in this study provide reference solely for beginning TE teachers, offering school administrators and TE

professionals' evidence on which to base retention efforts and professional development programs.

Respondents described facility management, which included equipment and funding, as a problem area. Equipment and funding are centralized components to the TE curriculum and are mutually linked for program improvement. The problem of adequate funding has been a consistent issue for over three decades for TE teachers starting with Wicklein (1993) and Wicklein (2004), to the most recent study by Lazaros and Rogers (2006). Teaching effectiveness is challenged because of working with "out-of-date equipment due to a lack of funding," as a respondent referenced in this study. Furthermore, the findings indicated that programs not meeting industry standards due to the lack of resources and up-to-date equipment were not considered high quality. Essentially, programs which are not adequately funded nor have the appropriate equipment do not prepare learners with career skills necessary for the TE pathway. Through undergraduate preparation and mentorships, beginning TE teachers need to be informed of available program monies such as Perkin funds and how to seek external funding from alternative sources via professional organizations and community partnerships.

Within the student management theme, discipline and student motivation were a prevailing problem described by beginning TE teachers. Among beginning teachers in general, discipline is a known problem (Daresh, 2003; Veenman, 1984) however this finding provided evidence it was a concern among beginning TE teachers. Comments made by beginning teachers such as "balancing how to discipline" and "how to deal with inappropriate behavior" were indicative of trying to find their own process of classroom management. Like Hughes (2012), student motivation was identified as a subtheme problem area in this study. The demeanor of students from laziness, uninterested, and doing the bare minimum to get by can cause frustration among teachers who are passionate about what they teach as well as a distraction to those students in the class who are motivated to do well. Individualized attention and developing relationships are potential methods to encourage student success which needs to be emphasized in teacher preparation methods coursework.

The theme of external relations was a problem area described by beginning TE teachers in this study. Specifically, image and faculty relationships were expressed as problematic areas. Image has been an ongoing concern found in previous retention TE studies (Lazaros & Rogers, 2006; Lee, 2009; Wicklein, 2004; Wicklein, 1993). Respondents in this study expressed experiencing inaccurate assumptions by school personnel and the public as to what TE is. The negative or outdated image, being or feeling misinformed about the rigorous requirements in TE, and questioning the value of the TE all contribute to this repeatedly reported problem. Furthermore, little support from colleagues can stem from the image concern. This has been unrelenting and needed to be dealt with tactfully due to non-tenured status; TE beginning teachers should readjust their thinking and approach towards colleagues on this matter. That is, they need to be visible participants in promoting TE. For example, co-teaching efforts and school-wide curriculum events can showcase how the application of science and mathematics embedded within the technology and engineering curriculum can strengthen students' abilities in the academic areas, assist in improving state test scores, and bolster grades.

Within the faculty relationships subtheme one respondent felt questioned by her abilities to be a TE teacher because she was female. TE teaching is a nontraditional career field for females. Historically, the number of female teachers in the TE content area has been very low. However, over the past 40 years the number of females teaching TE has increased. Sanders

(2001) reported that the number of female TE teachers in 1999 was 10 times more than in 1979. In more recent research, between one quarter and one third of TE teachers were found to be female (Ernst & Williams, 2015; Williams, 2019). Because of the growing pool of female TE teacher; down the road, new female TE professionals will have more resources, such as female mentors, to overcome the challenges and problems which face this group.

The fourth theme, instructional management was described as a problem by beginning TE teachers. Specifically, variance in student abilities and class preparation were expressed as problematic areas. These concerns have been identified in previous teacher retention studies (Daresh, 2003; Steinke & Putnam, 2007; Veenman, 1984; Zirkle & Winegardner, 2007) but a first citation among beginning TE teachers. The responses identified in this theme can be predicated in teacher education programs. For example, require inclusion coursework, such as a special education class to learn about disabilities, decipher IEP and 504 plans and make student accommodations or integrate topics in methods and curriculum courses that discusses as how to differentiate instruction for low to high level achieving students, develop courses using state and professional teaching standards and state guidelines, and strengthen curriculum development.

Problems as Motivator and Hygiene Factors

Applying the results to this study's theoretical framework, the challenges can be classified as noted above into two categories based on Herzberg's (1966) theory: motivator (intrinsic) and hygiene (extrinsic) factors. According to Herzberg (1966), the challenges identified can be located on the negative end of the two factors' respective continuums: no satisfaction (motivator's continuum) and dissatisfaction (hygiene's continuum). This means that both factor sets can contribute to unfavorable experiences for a teacher, thus decreasing their satisfaction level. Attempts to intervene to alleviate challenges can shift the levels of satisfaction towards the positive ends of each factor's continuum. However, if the identified challenges are not resolved, it could potentially impact teachers and cause them to leave the teaching profession.

For example, poor faculty relationships, which is considered a hygiene factor, was identified as a problem area, located on the negative end of the dissatisfaction continuum. If measures are taken such that TE collegial relationships are improved, is no longer a problem. Thus, this prior problem slides to the positive end of the continuum. If nothing is done to correct the problem of poor faculty relationships, the problem stays at the negative end of the continuum, and according to the Motivation-Hygiene Theory, it is more likely the teacher will leave their teaching position. Knowing the challenges identified by beginning TE teachers themselves can assist administration and TE teacher education programs tailor their focus and curriculum to address these areas early and curtail emotions of dissatisfaction that may cause voluntary exits.

Limitations

A limitation of the study was that it only surveyed teachers in one state. Therefore, the findings and conclusions cannot be generalized to other populations. Another limitation of the study was that the survey consisted of only one question. More questions may have elicited more and/or different responses. Respondents also did not have a chance to ask questions or gather information as to what types of problems they should identify. However, this also could be positive, as respondents were not led to answer the question based on the researcher's response or nonverbals.

Recommendations

Many teachers, especially beginning teachers, leave the profession because of problems they face in their teaching assignments. Those responsible for the preparation and retention of TE teachers then must recognize challenges faced by beginning TE teachers and gain a better understanding of how to best address these problems.

The following recommendations are based on the outcomes of this study.

1. TE teacher educators need to ensure teacher candidates are prepared to teach with and without savvy technology, software, and equipment.
2. Administration needs to set aside adequate time to discuss how program funding is structured and funneled within the school district and programs as well as how to request for supplies and equipment.
3. TE teacher education programs need to ensure the challenges identified (e.g., discipline, instructional methods, budgeting) in this study are adequately being addressed within their program of study coursework.
4. Stakeholders, including TE university teacher education faculty, state TE staff, TE professional organization leaders, and veteran and novice TE teachers could jointly develop and coordinate in-service workshops and opportunities for professional development with topics based on the challenges identified from this study. Examples of topics include classroom management, funding sources, and professionalism. These could be delivered synchronously locally and regionally, as well as delivered asynchronously through online modules or webinars.
5. Administration needs to be informed of the challenges identified in this study faced by beginning TE teachers, so they can strategize a plan of action to resolve or curtail the identified problems. For example, the use of mentoring, one-on-one 'wellness' checks, or provisional CTE area programming would be beneficial. Additionally, administrators need to be proactive in helping beginning teachers during their induction period.
6. TE teacher educators and induction coordinators could use the challenges described in this study as a foundation for case studies. These authentic case studies could be used as instructional tools to expose pre-service and beginning teachers to potential problems they will likely encounter. Conversations about dilemmas prior to their occurrence can help novice teachers identify multiple solutions or consequences in handling problems, sharpen their decision-making skills, and improve their confidence.
7. TE teachers beginning their careers could benefit from a mentor. To be most effective, however, the mentor would need to be a TE teacher or if there is not a TE teacher in proximity, a senior CTE faculty member could suffice. Giving beginning teachers an outlet to safely express concerns or seek advice could dictate the novice teacher's success or failure in the classroom.
8. Pre-service or beginning TE teachers [who migrate] need to ask during their interview to what extent is induction programming offered to beginning teachers, specifically in TE.
9. Pre-service and beginning TE teachers need to be informed of the importance of professional organizations and the benefits associated with being a member. The major benefit

is networking. Teachers can ‘bounce’ ideas off each other, share lessons or projects, and seek or give advice.

Conclusions

By adequately preparing TE teachers at the pre-service and entry levels to handle potential problems, the profession can increase job satisfaction and reduce teacher attrition in efforts to eliminate the TE teacher national shortage. Further research should include the following:

1. follow-up study to determine improvement of the challenges described by beginning TE teachers over time;
2. survey and conduct interviews with school administrators to find if they view the described problems in this study as relevant;
3. survey and/or conduct focus groups with TE teachers and administrators to seek resolutions to the identified challenges; and
4. expand the scope of the study to a regional population.

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