

# KEEPING APPLIED CONSTRUCTION TEACHERS IN THE SECONDARY SCHOOL SYSTEM

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## Abstract

The purpose of this study was to investigate the reasons why applied construction teachers in the Career and Technology Education (CTE) field are leaving the teaching profession in their first five years of service or, if they stayed, what were the dominant factors that caused them to consider leaving the profession and what were the factors that were causing them to remain in the CTE field in one Midwestern state. This was done through the triangulation of 44 mixed-design surveys with open-ended questions and six semi-structured interviews.

The data revealed there was a significant difference in the retention rates of four-year teachers with teaching degrees and alternatively certified teachers. The four-year teachers with teaching degrees and a Bachelor of Science degree in Education had a higher retention rate than those teaching with construction experience and alternative certifications. The data also revealed that the only significant difference in why four-year teachers with teaching degrees and alternatively certified teachers had considered leaving the profession was that the alternatively certified teachers were considering leaving because of limited opportunities for professional advancement.

The main reason teachers who had been teaching more than three years thought that teachers were leaving their profession was due to low pay; however, the teachers who had left stated that salary was not at all important in their decision to leave the CTE teaching profession and they stated that their main concerns were student discipline problems, dealing with special-needs students that were not interested in the program, poor student motivation, and lack of influence over school policies. Considerations of why teachers were thinking about leaving the profession included low salary, inadequate support from administration, and student issues, especially discipline and poor motivation.

The data showed, overwhelming, the reasons why teachers were staying in the profession. Over 75% of the responses dealt with enjoyment of working with the students and seeing student success in their field, followed by teacher benefits and a strong teacher retirement program.

## Introduction

The educational community understands that there is a shortage of quality teachers in classrooms across America. The National Commission on Teaching and America's Future [1] announced that teacher retention was a national crisis, and Bartell [2] agreed when he stated "the need for well-qualified, highly competent teachers has never been greater". The CTE field has not been immune to the teacher-shortage problem. A study done by Heath-Camp & Camp [3] reported that 15% of newly hired vocational education teachers leave after their first year, and an astonishing 48% of trade and industrial arts teachers leave before their third year has ended. Teachers going into education and not staying in the field long enough to become an established, viable asset to the program is one of the problems facing CTE programs today [4], [5].

Many students benefit greatly from these hands-on learning environments by attaining skills that will help them get a job and provide earnings both before and after graduation. These hands-on experiences will also provide the benefits of increasing student engagement, retention, persistence, and directing them to postsecondary education and the pursuit of lifelong learning [6]. However, research done by Gray & Walter [7] reveals there is a general shortage of CTE teachers, and "in some programs, such as technology education, the shortage is so severe that it threatens the program of study's very existence".

Therefore, using quantitative and qualitative data, this current study examined the reasons construction teachers in the CTE field left the teaching profession in a Midwestern state in their first five years of service or, if they stayed, what were the dominant factors that caused them to consider leaving the profession and what were the factors that caused them to remain in the CTE field. In addition, ideas for local industry to support and help retain current CTE teachers were considered.

## Design

The research questions for this study were designed to reveal descriptive, quantitative comparison data regarding any difference in the retention rates of four-year teachers with Bachelor of Science degrees in Education from CTE

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programs compared with alternatively certified teachers. In this Midwestern state, to be alternatively certified to teach at a CTC, the individual needed 6,000 hours of approved occupational experience within the past 10 years, would have to agree to have a mentor teacher assigned for two years, and agree to take a minimum of two courses a year, six semester hours, for three years for a total of six classes. The classes include information in basic foundations of education, curriculum development, methods of teaching, and assessment. The study also looked at differences in the reasons four-year degree CTE teachers have considered leaving compared to alternatively certified teachers, and the dominant reasons CTE teachers are leaving the profession during their critical first five years. In addition, phenomenological qualitative data based on participants' answers to open-ended questions and personal interviews were used to validate and expand on the dominant reasons construction CTE teachers have left the profession, factors causing existing teachers to consider leaving, and factors causing them to stay in the teaching profession.

The quantitative data were obtained from a survey consisting of closed and open-ended questions, and was administered to the population of construction CTE teachers in a Midwestern state's secondary school system during the school years of 2003-2007. By using information from the Department of Education, 109 individuals were qualified as teachers giving instruction in construction processes during the years in question. The comprehensive high schools employing a construction CTE teacher were called and the contact information was verified for each teacher at each of these institutions. Area Career and Technology Centers (CTC) were also contacted. CTCs are strategically located vocational/technical schools that service several area high schools with vocational programs that are too expensive to be offered at each individual school. Students are bused to these locations and every CTC with a construction teacher was also contacted. Each participant was emailed, informing them of the research taking place and asking for their assistance in the survey.

Participants were asked on the survey if they would be interested in taking part in a personal interview to collect more descriptive information that would "directly reflect the purpose of this study and guide in the identification of information rich cases" [8]. From these responses, a purposeful and convenient sampling was made in the form of follow-up interviews with both teachers who have stayed in the teaching profession and have been teaching for three or more consecutive years, and those who have left the teaching profession and changed vocations before having three years of teaching experience. These interviews were intended to pro-

vide the researcher with additional insight into retention and attrition of construction CTE teachers.

The researcher identified five construction CTE teachers who left before their third year of teaching. There were 12 more teachers that had less than three years of teaching experience, therefore their data were not used for the purposes of this study. Two of those who left the profession could not be found by the researcher; however, two of the remaining three filled out the survey and were interviewed. There were 92 potential candidates who had been teaching for three or more years; 18 were located in the comprehensive high school setting and the remainder were located in area CTCs. Of those 92 surveys that were sent out for participation in this study, 42 were returned, yielding a return rate of 45.7%. The teachers who began teaching after the 2006 school year and were still teaching at the beginning of the 2008-09 school year did not have three years of experience, and therefore their data were not used for the purposes of this study.

Semi-structured, follow-up interviews were then conducted by the researcher. The researcher interviewed both of the teachers who had left the profession and four of the teachers who had been in the profession more than three years, both in the comprehensive high school and CTC settings. The selected individuals included both four-year degree CTE teachers and alternatively certified teachers. The interview served as a probe of the questionnaire responses and provided a purposeful sampling of participants with the opportunity to extend their open-ended written answers and further consider related issues of retention and attrition of construction CTE teachers.

## Findings

### Demographics

All of the respondents were male. The average age of the respondents was 48 with an average of 13 years of teaching experience. It should also be noted that 25% of the teachers answering the survey were at least 55 years old and several stated they would be retiring in the next three years. Seventy-seven percent of the respondents were teaching at a CTC and 73% were teaching with their alternative certification. Four of the alternatively certified teachers had a four-year Bachelor of Science degree. The four degreed teachers who were certified had degrees in Construction Management, Elementary Education, Forestry, and Environmental Design.

## Retention Rates

There was a significant difference in the retention rate of four-year teachers with teaching degrees compared to their alternatively certified counterparts. These four-year teachers with teaching degrees had a higher retention rate. This is in agreement with other research that has been done on a national level; alternatively certified teachers have a lower retention rate compared to the four-year teachers with teaching degrees [9-11].

## Differences in Reasons Four-year and Alternatively Certified Teachers Have Considered Leaving

Forty-two participants rated 13 possible reasons for leaving the profession on a scale of 1 (Not at all Important) to 5 (Extremely Important). An independent-samples t-test was conducted to compare the means of each answer between the two groups of teachers; the significance level was .05. Analysis revealed one significant difference between the possible reasons the four-year construction CTE educators considered leaving the profession from those teachers having an alternative certification. Alternatively certified teach-

ers ( $M = 3.07, SD = 1.22$ ) rated "Poor opportunities for professional advancement" significantly more important compared to their four-year colleagues with teaching degrees ( $M = 2.08, SD = 1.12$ ). Therefore, it can be concluded from the data that "Poor opportunities for professional advancement" is less important to four-year teaching degreed teacher,  $t(42) = 2.50, p = .02$ , and consequently may believe they are in a better position for advancement than their alternatively certified counterparts (Table 1).

## Reasons Teachers Have Left the Profession

Current construction CTE teachers believed salary was the number one issue in teachers' decisions to leave the profession. However, those leaving the profession contributing to this study revealed that salary issues were not important in their decision to change positions. They understood the salary issues when they took the position. What they were unprepared for were the discipline problems. Those leaving ranked student discipline problems as their highest concern. One teacher stated that new teachers "do not realize the student discipline problem would be such an issue" and one remarked that the "frustration with the lack of discipline of students is a major concern." One teacher who left the profession stated, "If the counselors had to spend a week in my

**Table 1. Reasons Teachers Have Considered Leaving the Teaching Profession**

Reason	Four-year Teaching Degree	Alternative Certification				
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Poor salary	3.85	0.99	3.69	1.07	0.49	0.66
Inadequate support from administration	3.69	1.44	3.24	1.21	1.05	0.30
Student discipline problems	3.54	1.13	3.21	1.24	0.83	0.41
Lack of influence over school policies	3.00	1.08	3.07	1.36	0.16	0.87
Lack of control over own classroom	2.31	1.65	2.52	1.57	0.39	0.70
Challenges caused by special needs students	2.85	1.46	2.76	1.24	0.20	0.84
Not given enough time	2.62	1.12	2.48	1.21	0.34	0.74
Poor student motivation to learn	3.31	1.38	3.45	1.18	0.34	0.74
Inadequate mentoring	2.38	0.96	2.69	1.34	0.84	0.41
Poor opportunities for advancement	2.08	1.12	3.07	1.22	2.50	0.02
Class size too large	2.92	1.32	2.55	1.43	0.80	0.43
Sometimes do not feel suited for teaching	1.77	1.17	1.90	1.26	0.31	0.76
Preparation for teaching inadequate	2.23	1.54	2.00	1.20	0.53	0.60

*Means, Standard Deviations, t Statistics and for Career and Technology Education (CTE) Teachers with a Four-year Teaching Degree vs. Construction Experience with Alternative Certification*

Note: N=42

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class, that would change everything. I tried to tell them, if you would be afraid to leave this kid alone that you've assigned to my class with a power tool or a blow torch or a framing hammer for five minutes, if you're afraid to leave them alone, don't put them in my class."

Challenges caused by special-needs students and poor student motivation ranked a close second and third, respectively. Teachers who had been in the profession more than three years also noted student issues and poor support from administration as major concerns for those leaving the profession.

## Reasons Teachers Have Considered Leaving the Profession

The main reasons current construction CTE teachers have considered leaving the teaching profession, ranked in order of importance, were poor salary, inadequate support from administration, poor student motivation to learn, student discipline problems, and lack of influence over school policies. Several of the teachers commented that industry is not involved at all in their CTE programs. All of these issues were in agreement with other research studies. Therefore, this study suggests that even though strides have been made in teacher retention, there are still concerns that should be considered to help retain CTE teachers.

## Reasons Why Teachers Are Staying in the Profession

There were two dominant reasons why current construction CTE teachers were staying in the profession. The overwhelming response given by 76 % of the teachers who had been in the teaching profession more than three years was their enjoyment of working with the students who wanted to learn and seeing students learn and become skillful in the construction craft. One wrote, "I enjoy having my students being able to learn something they were having a hard time wrapping their minds around", and another commented they had a "belief in the need for students to know a skill that will/can provide a living for them". One stated there is "the reward of how it feels when I make a connection with students that have traditionally been cast off as worthless by academic teachers, and then they excel in my program."

The other prevailing reason given by 33% of the teachers were the benefits and retirement that went with the job. Several teachers indicated they would have left the profession if it were not for the secure and excellent retirement package. Therefore, these positive factors should be addressed more

frequently to help promote an optimistic school climate and encourage current CTE teachers.

## Conclusion

The study's findings have direct implications for administrators, counselors, school boards, state departments of education, post-secondary institutions, and the construction industry. Since 73% of the teachers responding had their alternative teaching certificate, it appears that alternative certification will continue to play a significant role in the near future. Therefore, state departments of education should continue to strive to give these individuals the very best training possible in the shortest period of time to prepare them for their first-year teaching experience. Since the review of literature and this study both indicate higher attrition rates for alternatively certified teachers, it is imperative the educational system do everything it can to ensure the success of these individuals.

This training should emphasize classroom management, student discipline preparation, and grounding in the areas of handling special-needs students. These beginning teachers need to be prepared for students' lack of motivation and lack of respect. One teacher said he thought teachers were leaving because the "instructors were thrown to the wolves by administration." The school counselors can also play an important role in making sure the students enrolling in the CTE programs are interested in the area into which they are being placed and that the program is not used as a "dumping ground" for problem students. Many students are placed in CTE programs by the counselor simply because they do not know what else to do with them; it can become a detriment to the entire program. As one teacher pointed out, "[I am] frustrated over a single student occupying the majority of my time." Therefore, the counselors should be educated in the construction CTE program and what basic skills are necessary to make a successful student in that program so they can be placed accordingly.

In addition, because student discipline is such a major factor in the retention of construction CTE teachers, administrators need to take an active role in classroom and student discipline and support the teacher so they do not believe they are fighting the discipline battle alone. The educational community should also encourage CTE teachers who have a good understanding of CTE protocol to further their education and become administrators as they will have empathy for the discipline issue. Administrators can show tremendous support by taking the appropriate action with problem students and actively reinforce the concept that the teacher is not in this profession alone.

Administrators, school boards, the surrounding community, and industry can also bolster the retention of construction CTE teachers by giving them positive reinforcement at every opportunity. Many of these teachers have left prominent, high-paying jobs because they wanted to become teachers. The data suggest that many of these alternatively certified teachers are thinking about leaving because of the pay, and there is no opportunity for advancement in their field. Inman and Marlow [12] stated that the teacher most likely to leave the profession is the male teaching in the high school setting who has not been teaching very long. These teachers have communicated that the professional prestige of the profession is not as good as they originally perceived it would be. Therefore, these teachers need to be encouraged at every opportunity and shown they are needed and supplying a valuable service to the student, the school, and the community.

Local industry needs to become actively involved with CTE programs and educators. Some of the survey suggestions included “help students job shadow”, “help subsidize pay and give teacher bonuses or incentives to stay in the teaching field”, “partner with classes and provide opportunities for teachers to remain abreast of new technology”, and “create a unified certification process for students and then make it a priority to hire those students.” Additional suggestions included educational support on new advances in technology and equipment and financial support for newer and more advanced equipment to the program. These teachers need to be encouraged at every opportunity so that they become a positive driving force in the lives of their students and in the future workforce.

In addition, since the data indicated the number one reason teachers were staying in the field was their enjoyment of seeing students learn and seeing the students becoming successful and skillful in their field, it would be advantageous for the educational community to convey these success stories to the CTE teaching profession. Therefore, it would be an asset to the CTE teaching community if a newsletter or website could be established, where teachers could communicate their accomplishments, projects, and students’ success stories to help strengthen and encourage other CTE teachers across the region.

## References

[1] National Commission on Teaching and America’s Future. (2003). *No dream denied: A pledge to America’s children*. Washington, D. C.

[2] Bartell, C. A. (2005). *Cultivating high-quality teaching through induction and mentoring*. Thousand Oaks: Corwin Press.

[3] Heath-Camp B., & Camp, W. G. (1990). Induction experiences and needs of beginning vocational teachers without teacher education backgrounds. *Occupational Education Forum*, 19(1), 6-16.

[4] McCaslin, N. L., & Parks, D. (2002). *Teacher education in career and technical education: Background and policy implications for the new millennium*. Columbus, OH: National Dissemination Center for Career and Technical Education. (ERIC Document Reproduction Service No. ED462546)

[5] Osgood, V. M., & Self, M. J. (2002, December). *Pathway to survival – A new teacher induction initiative*. Paper presented at the meeting of the annual conference of the Association for Career and Technical Education, Las Vegas, NV.

[6] Brown, B. L. (2003). *The benefits of career and technical education. Trends and issues alert no. 49*. The Ohio State University, College of Education. (ERIC Document Reproduction Service No. ED481326)

[7] Gray, K., & Walter, R. (2001). Reforming career and technical education teacher licensure and preparation: A public policy synthesis. *National Dissemination Center for Career and Technical Education*. Retrieved May 8, 2008, from <http://www.nccte.org/publications/infosynthesis/infopaper/infopaper01/infopaper01.pdf>.

[8] Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Josey-Bass.

[9] Berry, B. (2001). Dodging the “silver bullet” and doing what is right for students. The State Education Standard, National Association of State Boards of Education, Alexandria, VA. Retrieved May 8, 2008, from [http://www.nasbe.org/standard/1\\_winter\\_2000/berry.pdf](http://www.nasbe.org/standard/1_winter_2000/berry.pdf).

[10] Darling-Hammond, L. (2000). Solving the dilemmas of teacher supply, demand, and standards: How we can ensure a competent, caring, and qualified teacher for every child. NCTAF Publications. Retrieved December 31, 2007, from <http://www.nctaf.org/documents/supply-demand-standards>.

[11] Darling-Hammond, L., Berry, B., & Thoreson, A. (2001). Does Teacher Certification Matter? Evaluating the Evidence. *Educational Evaluation and Policy Analysis*, 23(1), 57-77.

[12] Inman, D., & Marlow, L. (2004). Teacher retention: Why do beginning teachers remain in the profession? *Education*, 124(4), 605-614.

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