Measuring Teacher Effectiveness When Comparing Alternatively and Traditionally Licensed High School Technology Education Teachers in North Carolina

According to No Child Left Behind (NCLB), the definition of a highly qualified teacher includes three components: obtaining a bachelor's degree; having full licensure as defined by the state; and demonstrating competency, as defined by the state, in each subject taught (U.S. Department of Education, 2004). However, NCLB does not specifically include career and technical education, of which technology education is a part. In North Carolina, all fields of career and technical education, except trade and industrial, follow NCLB's requirements for achieving the highly qualified teacher status (North Carolina Association of Teachers, 2005; North Carolina Department of Public Instruction, 2009). Due to the difficulty of filling all teaching positions with highly qualified teachers, an alternative licensure program was established to allow individuals without an education degree from a university-based teacher preparation program to transfer their skills from the workplace into the classroom (Hoepfl, 2001).

Although originally developed to quickly fill openings in an emergency situation, alternative licensure is now being used more readily for filling teaching positions. This has caused some concern about the effectiveness of the alternatively licensed teachers. Some educators feel that an alternatively licensed teacher does not have the necessary understanding of pedagogical theories and practices they would obtain when completing a traditional education program (Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005). Because of this lack of pedagogical knowledge, this teacher would have difficulty fully accommodating students' educational needs and would not be able to develop and deliver effective lesson plans. This in turn would result in lower student achievement. Darling-Hammond et al. found the other side of the debate is, through practical industry work experiences, alternatively licensed teachers have gained knowledge about the course content that is more in-depth than the knowledge gained in the traditional education program. From working in the corporate field, a teacher would have learned more authentic applications of the content knowledge and could therefore be able to provide the students a more relevant experience in the classroom than would a traditionally licensed teacher.
When measuring student achievement, current research shows mixed data on the effectiveness of alternatively licensed teachers compared to that of traditionally licensed teachers (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Bradshaw & Hawk, 1996; Hawley, 1992). There has been little research,

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particularly in North Carolina, concerning these comparisons in the field of technology education (Foster, 1996; Haynie, 1998; Hoepfl, 1997, 2001; Merril, 2004; Pavlova, 2005). However, from 1986–1996, there was a 12% increase in the number of alternatively licensed teachers in North Carolina (Bradshaw & Hawk, 1996). With the increase in alternatively licensed teachers, there is a greater need for research in this area.

This quasi-experiment was designed to determine if there was a significant difference in teacher effectiveness when comparing alternatively licensed and traditionally licensed high school technology education teachers in North Carolina. The methodology was designed to use both a quantitative and qualitative approach to utilize triangulation. If the outcomes are similar, there is evidence the results of the study are valid (Bryman, 2006; Creswell, 2003; Jick, 1979).

The research questions were as follows:

1. Are there significant differences in achievement, as measured by percent proficiency on the end of year test, of students taught by alternatively licensed technology education teachers versus those taught by traditionally licensed technology education teachers in North Carolina?
2. Are there significant differences in the pedagogical management practices, as measured by time on task, of alternatively licensed technology education teachers versus traditionally licensed technology education teachers in North Carolina?
3. Are there significant differences in the preparation, performance, and professional development needs, as measured by the principal's perception, of alternatively licensed technology education teachers versus traditionally licensed technology education teachers in North Carolina?

By comparing test results, the students' time on task, and qualitative data, a conclusion can be drawn as to whether or not there are any differences in alternatively licensed technology education teachers and traditionally licensed technology education teachers in North Carolina.

Methodology

Research Question 1

For the first research question, the sample included all of the technology education teachers in North Carolina that were eligible based on the requirements of the study. The sample consisted of two groups, the alternatively licensed technology education teachers and the traditionally licensed teachers. A one-way ANOVA quantitative analysis used the percent of students proficient on the end of year exam as the dependent variable and the teacher's licensure type as the independent variable. End of year test scores have historically been used to measure teacher effectiveness (Clotfelter, Ladd, & Vigdor, 2006;

D'Agostino & Powers, 2009; Sawyer, 2007). These tests are easily graded and relate to student achievement in a particular course. However, there is much debate about using standardized test scores as a definitive measure of teacher effectiveness. Therefore, end of year test scores were used as only one component of this research study. The test results came from the North Carolina standardized VoCATS exam from the Career and Technical education department for the 2009–2010 school year and included five courses within the NC technology education curriculum: Fundamentals of Technology, Communication Systems, Manufacturing Systems, Structural Systems, and Transportation Systems. This information is available to the public but must be formally requested through the North Carolina Department of Public Instruction (NCDPI) research department. The researcher chose these five courses because these are the only courses within the NC technology education curriculum that can be taught with a basic technology education license and have a standardized end of course exam. All other technology education courses were not included in the analysis because they require an add-on certification and cannot be taught by a regularly licensed teacher or do not have an end of course exam. Having an add-on certification means that teacher attended a workshop in which specific content knowledge was gained. The purpose of only using courses that do not require additional certifications is to limit, as much as possible, the contributors to content knowledge that would affect the percent proficiency of students on the end of course exam.

There were 157 high school technology education teachers that represent all the teachers with a basic technology education teaching license and teach one of the five courses in the study. There are more licensed technology education teachers in the state, but the others have met additional criteria that eliminate them from the parameters of this study. The final sample includes 76 alternatively licensed teachers, 34 traditionally licensed teachers and 47 teachers that the NCDPI designated as both alternatively licensed and traditionally licensed. The teachers designated as having both types of licensure were eliminated for Research Question 1 since their specific licensure type cannot be determined. The test score results provided by NCDPI are reported in terms of the percent of students obtaining proficiency by course, and not teacher, for each course taught at a particular school. Therefore, if more than one teacher from the same school taught the same course, it could not be determined from the data which test results were achieved by which teacher, and these teachers were removed from the study. The teacher information is summarized in Table 1 (next page).

Table 1
Total Number of Teachers Based on Licensure Type

Course	Alternative	Traditional	Total
All Five Combined	55	26	81
Fund. of Tech.	44	18	62
Communication	13	7	20
Manufacturing	7	5	12
Structural	10	11	21
Transportation	11	8	19

At this point, the data were analyzed to determine if there were any statistically significant differences in the overall percent proficiency of students with all five courses combined and then for each of the five courses separately. Since the systems courses are more skills and trade-based, the researcher felt this will be a valuable component of comparing the different licensure types. From this data set, a one-way ANOVA was conducted using the statistical software SPSS.

Research Question 2

A sub-sample of five teachers from each group was chosen from within the original sample. The smaller sample size permitted the capability of performing detailed video-taped observations to determine the percent of students' time on task during the delivery of a typical classroom lesson. In this study, a typical lesson was not defined but the researcher but was left up to the teacher to decide how they normally conduct a class period. This gives the researcher the best opportunity to record the natural tendencies of classroom settings and management techniques performed by the teacher. Prior research has shown that increasing a student's time on task will increase the opportunity for achievement (American Association of School Administrators, 1982; Biderman, Nguyen, & Sebren, 2008; Berliner, 1990; Brandt, 1982; Heck, 2007; Hines, Kromrey, Swarzman, Mann, & Homan, 1986; Huitt & Segars, 1980; Opdenakker & Damme, 2006; Prater, 1992, Seifert & Beck, 1984). This research project used the time on task of students as one measure of comparing the effectiveness of alternatively licensed and traditionally licensed technology education teachers. As previously mentioned, there were 157 high school technology education teachers that teach either Fundamentals of Technology or one of the four systems courses. For this portion of the study, the teachers that were shown to have both an alternative license and a traditional license were kept on the list. If one of these teachers participates in this portion of the study, their licensure type was verified by the researcher. If their licensure type could not be determined, they were ineligible for the study. Also, in order for a teacher to be eligible for this portion of the study, both the teacher and the teacher's principal had to agree to participate. If either the teacher or principal did not agree to participate, this

teacher was no longer considered eligible for the study and another teacher was contacted. When both the teacher and principal agreed to be in the study, the researcher verified the teacher's licensure type. This process was continued until there were five pairs of teachers and principals from each licensure type. Surveys were completed by the selected teachers to collect demographical and background information. The results for some of the survey questions are shown in Table 2 for alternatively licensed teachers and Table 3 (next page) for traditionally licensed teachers.

Table 2
Survey Results for Alternatively Licensed Teachers

	Participant				
Question	1	2	3	4	5
Years Teaching HS Tech Ed	5	4	6	10	6
Other Certification Areas	No	Elementary Ed; Trade & Industrial	No	Business Ed; Trade & Industrial	Trade & Industrial
Other Areas of Teaching Experience	3 years exceptional children	No	4 years micro-computer applications at University	10 years Business Ed, (along with Tech Ed)	26 years Trade & Industrial
Degrees Earned	BS Science	BS Science	BS Engineering, MS Manuf. Technology	BS Math, BS Computer Science, MS Engineering	BS Science
Any University courses in pedagogical management	No	No	No	No	No
Other work Experience	3 years residential construction, 3 years commercial construction	10 years residential construction	4 years furniture product development	5 years systems analyst	No

Table 3
Survey Results for Traditionally Licensed Teachers

	Participant				
Question	1	2	3	4	5
Years Teaching HS Tech Ed	26	15	18	20	16
Other Certification Areas	Trade & Industrial	Electronics; Metals	No	Trade & Industrial	No
Other Areas of Teaching Experience	15 years Trade & Industrial	5 years Industrial on-line at Univ.	No	12 years Trade & Industrial	No
Degrees Earned	BS Tech Ed	BS Tech Ed	BS Tech Ed	BS Tech Ed	BS Tech Ed
Any University courses in pedagogical management	Differentiated instruction; Varied delivery methods	Differentiated instruction; Varied delivery methods; Knowledge of different learning styles	Differentiated instruction; Varied delivery methods; Behavior management	Formative assessment to drive teaching methods; Project-based unit development	Behavior management
Other work Experience	Satisfactory; Wants to see greater desire for improving teaching methods	Satisfactory; Improve diversified instruction and varied use of technology	Satisfactory; Increase varied use of technology; Improve behavior management	Satisfactory	Excellent

This portion of the research used video recordings of the first 45 minutes of a classroom lesson by each of the ten teachers. Each video showed a wide angle view of the classroom so the researcher could see all the students during the entirety of the lesson. The time on task, as defined by the amount of time the student was engaged in the lesson plan as directed by the teacher, is reported as a numerical value of the percentage of students on task at three minute intervals, beginning five minutes after the start of class. This method of interval observations provides an opportunity for the teacher to transition among different teaching techniques and lesson plan activities (Allday, Duhon, Blackburn-Ellis, & Van Dycke, 2011; Colvin, Flannery, Sugai, & Monegan,

2009; Sindelar, Daunic, & Rennells, 2004). When the observer takes measurements at different increments, the observer records a better overall summary of different classroom settings and teacher behaviors, and the results of time on task measurements can be more generalized for that class period (Colvin et al., 2009; Hines et al., 1986). The interval observation instrument, which was specifically designed for a classroom observational study, was taken from work performed by Colvin et al., which was tested to a reliability of 0.93. Using SPSS, a one-way ANOVA was performed to determine if there were any statistically significant differences between the time on task of students for the two groups of teachers.

The classroom setting and teacher behavior was also recorded at each interval. The researcher performed a repeated measures analysis to determine if there were any statistically significant differences in the time on task of students within each classroom setting and teacher behavior. A repeated measures analysis is appropriate when the same main effect is being tested from exposure to different conditions (Field, 2008; Lix & Sajobi, 2010). Time on task was the dependent variable in both groups, but was being measured under different conditions at constant intervals. These different conditions were the classroom setting and teacher behavior. This would explain if certain classroom settings or teacher behaviors have the ability to maintain a higher on-task rate of students when comparing the two groups of teachers.

Research Question 3

Administrator's opinions are very important since their decisions can drastically change the direction of a technology education program (Jewell, 1995). In a study conducted by Jewell, North Carolina principals generally supported the need for technology education courses in all high schools. This same study also points out principals were found to have a high regard for the effectiveness of technology education teachers in general classroom management and content delivery (Jewell, 1995). The current research study is building on these findings and attempts to compare the principals' perspective on teacher effectiveness when comparing alternatively licensed and traditionally licensed technology education teachers. Research Question 3 involves audio-recorded telephone surveys with the principals of the teachers included in Research Question 2. The surveys were transcribed and reported as qualitative data, combining similar responses into various categories. This survey summarizes the principals' perceptions of the preparation, performance, and professional development needs of the two different groups of teachers.

Results

Research Question 1

The descriptive statistics for the five courses combined as well as each of the individual courses is shown in Table 4 (next page). A one-way ANOVA was

performed on the data set, and Table 5 (next page) shows results of the statistical analysis. All of the analyses passed the test for homogeneity of variances, meaning the variances of the two samples were not significantly different for each course taught. The results show there were no significant differences in the percent of students obtaining proficiency between the two groups of teachers for all five courses combined and each of the five courses individually.

Table 4

Descriptive Statistics for Number of Teachers and the Percent Proficiency of Students

Course	Licensure	N	Mean	Std. Dev.	Min.	Max
All Five Combined	Alternative	55	76.61	14.79	38.28	100.0
	Traditional	26	78.34	17.48	30.77	100.0
Fund. of Tech.	Alternative	44	75.55	15.01	33.33	97.80
	Traditional	18	77.74	18.14	30.77	97.22
Communication	Alternative	13	81.23	17.70	30.30	100.0
	Traditional	7	74.65	21.69	50.00	100.0
Manufacturing	Alternative	7	76.32	21.41	47.73	100.0
	Traditional	5	84.25	9.65	75.00	100.0
Structural	Alternative	10	80.19	19.23	45.83	100.0
	Traditional	11	76.99	23.15	33.33	100.0
Transportation	Alternative	11	78.26	17.27	52.63	100.0
	Traditional	8	84.87	18.40	47.37	100.0

Table 5

One-Way ANOVA for Percent Proficiency of Students

Course	DF	Mean Square	F	P-value
All Five Combined	1	53.82	0.219	0.641
Fund. of Tech.	1	61.33	0.241	0.625
Communication	1	197.06	0.539	0.472
Manufacturing	1	183.61	0.588	0.461
Structural	1	53.38	0.117	0.736
Transportation	1	202.43	0.643	0.434

Research Question 2

Time on task. Using SPSS, a one-way ANOVA was used to compare the average number of students on task between the two groups of teachers. The

descriptive statistics of the results are shown in Table 6 (next page) and the results for the statistical analysis are shown in Table 7. The analysis passed the test for tests for homogeneity of variances, meaning the variance of the two samples were not significantly different. With a $p = 0.755$, there was no significant difference in the time on task of students between the two groups of teachers.

Table 6

Descriptive Statistics for Time on Task of Students

Certification	N	Mean	Std. Dev.	Min.	Max
Alternative	5	0.758	0.104	0.612	0.857
Traditional	5	0.775	0.049	0.693	0.817

Table 7

One-Way ANOVA for Time on Task of Students

	DF	Mean Square	F	P-value
Between Groups	1	0.001	0.104	0.755
Within Groups	8	0.007		
Total	9			

Classroom settings and teacher behaviors. Table 8 (next page) shows the qualitative aspects of how each teacher choose to use their instructional time by displaying the frequency of classroom settings and teacher behaviors used by each group of teachers. This data would have been used to help explain any statistically significant differences in the time on task of students between the two groups if one had existed. However, since there were no significant differences, this data can be used to show there were some qualitative differences in the teaching styles between the two groups of teachers that will be addressed in the discussion section.

Table 8
Frequency of Classroom Settings and Teacher Behaviors

	Alternative		Traditional	
Classroom Setting	Occurrences	Average	Occurrences	Average
Large Group	26	5.2	35	7.0
Small Group	12	2.4	23	4.6
Individual	31	6.2	11	2.2
Transition	1	0.2	1	0.2
Teacher Behavior				
Lecture	14	2.8	35	7.0
Activity	12	2.4	8	1.6
Project	33	6.6	24	4.8
Assessment	11	2.2	3	0.6

Due to the nature of the data, there were not enough different types of classroom settings and teacher behaviors to perform a repeated measures statistical test. Not all of the teachers exhibited all the different types of classroom settings and behaviors during their instructional time. Therefore, there were not enough data points to make this type of analysis valid.

Research Question 3

Research Question 3 was designed to determine if the principals of the participants in Research Question 2 have a different perception of the preparation, performance, and professional development needs when comparing alternatively licensed and traditionally licensed technology education teachers. The results of the survey for the principals of the alternatively licensed teachers are shown in Table 9 (next page), and the results of the survey for the principals of the traditionally licensed teachers are shown in Table 10. The responses to the survey questions have been categorized and grouped together based on similar responses by the principals.

Table 9
Survey Results for Principals of Alternatively Licensed Teachers

	Participant Principal				
Question	1	2	3	4	5
Years Admin	7	9	15	3	5
Years Principal	3	4	8	1	3
Years at Current School	3	2	8	1	3
Teach Ed Teachers Supervised	2	5	7	3	3
Teacher's Content Knowledge	Good	Very Good	Good	Very Good	Good
Teacher's Pedagogical Knowledge	Good	Average	Good	Excellent	Good
Varied Instructional Strategies	Below Average	Average	Good	Good	Excellent; Good use of various technologies and differentiated instruction
Exam Scores	Below Average	Average	Excellent	Average	Excellent
Professional Development Needs	Pedagogical knowledge; Varied delivery methods	Varied delivery methods; behavior management	Varied delivery methods	Differentiated instruction	None
Overall Teacher Effectiveness	Satisfactory; Room for improvement	Satisfactory	Satisfactory; Improve various instructional strategies and behavior management	Very satisfied; Good expertise	Satisfactory; Improve involvement with extra-curricular activities

Table 10
Survey Results for Principals of Traditionally Licensed Teachers

	Participant Principal				
Question	1	2	3	4	5
Years Admin	14	7	11	12	9
Years Principal	8	2	5	1	4
Years at Current School	6	2	5	1	2
Teach Ed Teachers Supervised	4	3	6	6	3
Teacher's Content Knowledge	Good	Good	Good	Excellent	Excellent
Teacher's Pedagogical Knowledge	Good	Average	Average	Average	Excellent
Varied Instructional Strategies	Needs Improvement	Needs Improvement	Average	Good	Very Good
Exam Scores	Needs Improvement	Average	Average	Good	Very Good
Professional Development Needs	Differentiated instruction; Varied delivery methods	Differentiated instruction; Varied delivery methods; Knowledge of different learning styles	Differentiated instruction; Varied delivery methods; Behavior management	Formative assessment to drive teaching methods; Project-based unit development	Behavior management
Overall Teacher Effectiveness	Satisfactory; Wants to see greater desire for improving teaching methods	Satisfactory; Improve diversified instruction and varied use of technology	Satisfactory; Increase varied use of technology; Improve behavior management	Satisfactory	Excellent

Discussion

The quantitative analysis of the experiment shows there were no significant differences between the two groups of teachers. There are several possible reasons why the statistical analysis shows there were no differences. The first is there may not be a significant difference between the two groups of teachers when comparing the percent of students proficient on the VoCATS. This would support the literature that says there are no statistically significant differences in teacher effectiveness when comparing alternatively licensed teachers and traditionally licensed teachers (Bradshaw & Hawk, 1996; Darling-Hammond et al., 2005; Feiman-Nemser, 1989; Hoepfl, 2001; Litowitz, 1998; Reese, 2010; Sindelar et al., 2004; Stoddart & Floden, 1995). Another reason a significant difference may not have been detected is because of the lack of power of the statistical analysis. Once the data filtration process was completed on the two groups of teachers, there were 55 alternatively licensed teachers and 26 traditionally licensed teachers for which to compare test scores. Although the sample sizes were large enough for a valid analysis, there were approximately 2.1 times more alternatively licensed teachers than traditionally licensed teachers. This difference in sample sizes causes a less powerful result and, therefore, creates less of a chance in discovering a statistically significant difference if one exists than if the sample sizes were equal (Guo & Luh, 2008; Tam & Wisenbaker, 1996; Wilcox, 1989).

Although there were no statistically significant differences, it is significant for the researcher when analyzing the qualitative differences and determining there is a need for looking more in-depth at these issues in future research. The two analyses with larger sample sizes were when all five courses were combined and Fundamentals of Technology. In both of these comparisons, the traditionally licensed teachers have slightly higher means. When considering the four systems, Communication Systems and Structural Systems had higher means for alternatively licensed teachers, while Manufacturing Systems and Transportation Systems had higher means for traditionally licensed teachers. Each of these means have greater differences than those of all five courses combined and Fundamentals of Technology. This could be due to smaller sample sizes and less powerful results. But, it raises the question of why some courses have a higher mean for alternatively licensed teachers and other courses have higher means for traditionally licensed teachers. Since the systems courses contain content that is more industry-related and skill-based, the researcher felt it was valuable to determine if industry experience could be a factor when analyzing the percent proficiency of students on the VoCATS exam when comparing the two groups of teachers.

Research Question 2

Time on task. Even though there were no significant differences between the ratios of students on task of the two groups of teachers, there were some

qualitative observations significant to the researcher. The alternative licensed teachers had both the maximum and the minimum ratio of students on task during the observation intervals. This tells the researcher there are potentially some pedagogical management techniques that alternatively licensed teachers are using that are both more effective and less effective than the techniques used by traditionally licensed teachers. These are the kinds of differences the researcher was looking for and, therefore, evidence that more detailed research in this area would be beneficial.

Classroom settings and teacher behaviors. The qualitative analysis shows the traditionally licensed teachers used more large and small group settings with lecture, while the alternatively licensed teachers used more individual work with activities, projects, and assessments. As mentioned in the results, a repeated measures analysis was not performed on the classroom setting and teacher behaviors because the data were not complete enough for the results to have any statistical significance.

Research Question 3

Survey questions 1 through 4 were designed to gather background information about the principals' experiences as administrators. This tells how much experience each principal has working with technology education teachers. When one compares these results, the average years of experience for the principals of both groups of teachers are similar. Both groups have had approximately the same number of years of experience as administrators and have also had the opportunity to work with approximately the same number of technology education teachers. Survey questions 5 and 6 were designed to determine if the principals of the two groups of teachers had different perceptions of the teachers' curriculum content and pedagogical knowledge. When looking at the teachers' preparation, there were no significant differences in the principals' perceptions of the curriculum content and pedagogical knowledge between the two groups of teachers. Both groups of principals were pleased with the teachers' content knowledge in technology education.

Survey questions 7 and 8 are related to the principals' perceptions of the different types of instructional techniques used in the classroom to deliver the content. Overall, there was not a noticeable difference between the principals' perceptions of the use of different instructional techniques between the two groups of teachers. Concerning the teachers' end of year tests results on the VoCATS exam, one principal from each group of teachers was not satisfied. However, there were not any significant differences between the two groups of principals when commenting on their teacher's end of year test results.

Survey question 9 was designed to get the principals' perceptions on what they perceived as professional development needs of the teacher. The results show there were no significant differences between the two groups of teachers. However, the researcher would like to point out some of the differences that

were mentioned. The only time that pedagogical knowledge was mentioned for a professional development need was for an alternatively licensed teacher. Behavior management was mentioned twice for traditionally licensed teachers and once for an alternatively licensed teacher. The need for increasing the variety of teaching methods was mentioned three times for both groups of teachers. Increasing the differentiation of instruction was mentioned three times for traditionally licensed teachers and once for alternatively licensed teachers. One interesting comment was the principal of a traditionally licensed teacher wanted to see more project-based learning to occur in the classroom. However, there were no observable significant differences among the responses. The researcher understands there is a need for all teachers to pursue professional development opportunities, and these results show that both alternatively licensed teachers and traditionally license teachers in technology education experience some of the same needs.

The last question gave the principals a chance to comment on how they felt about their teacher's overall effectiveness. By providing a general open-ended question, this gave the principals a chance to add other comments that were not specifically related to the previous questions in the survey. Every principal said they were satisfied with the effectiveness of their technology education teacher. In addition, some of the principals made extra comments about how they felt the teacher needed improvement in certain areas. Most of the areas of improvement were the same as mentioned in question 9 regarding professional development. One principal of an alternatively licensed teacher made a positive comment about how he or she appreciated the teacher's commitment to after school technology education related clubs and activities. However, there were no distinct differences in the comments made by the principals of both groups of teachers.

Conclusion

In this study, three research questions were used to provide a methodology for comparing the effectiveness of alternatively licensed and traditionally licensed technology education teachers in North Carolina. As discussed earlier, current research shows there is mixed data when comparing the effectiveness of alternatively licensed teachers compared to traditionally licensed teachers. This study was designed to build off this existing research and examine how these two groups of teachers compare to each other in technology education in North Carolina. By using the methodology in this study, the researcher was able to provide evidence that there may not be any statistically significant differences between alternatively licensed and traditionally licensed technology education teachers in North Carolina concerning the percent of students proficient on the end of year VoCATS exam, the time on task of students, and the principals' perceptions of the teachers' effectiveness. Supporters of each type of licensure program argue both licensure types produce competent teachers and having two

different routes are likely to produce teachers with different expertise and skill sets (Feiman-Nemser, 1989; Stoddart and Flodon, 1995).

More empirical data needs to be provided for comparing alternatively licensed and traditionally licensed technology education teachers when measuring student achievement in North Carolina. Technology education is a field that ranges from having trade-related curriculums to courses more focused on the academic aspect of the design process. The content knowledge required to accommodate this range of knowledge lends itself to using characteristics of both alternatively licensed and traditionally licensed teachers (Darling-Hammond et al., 2005; Bradshaw & Hawk, 1996). The researcher believes that both types of licensure provide value to the technology education classroom. Each type of licensed teacher offers a distinct set of skills and knowledge that create unique learning opportunities for students. If the characteristics of what makes technology education teachers more successful in the classroom are better understood, then alternatively licensed teachers can be more supported as well as improving traditional preparation programs.

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