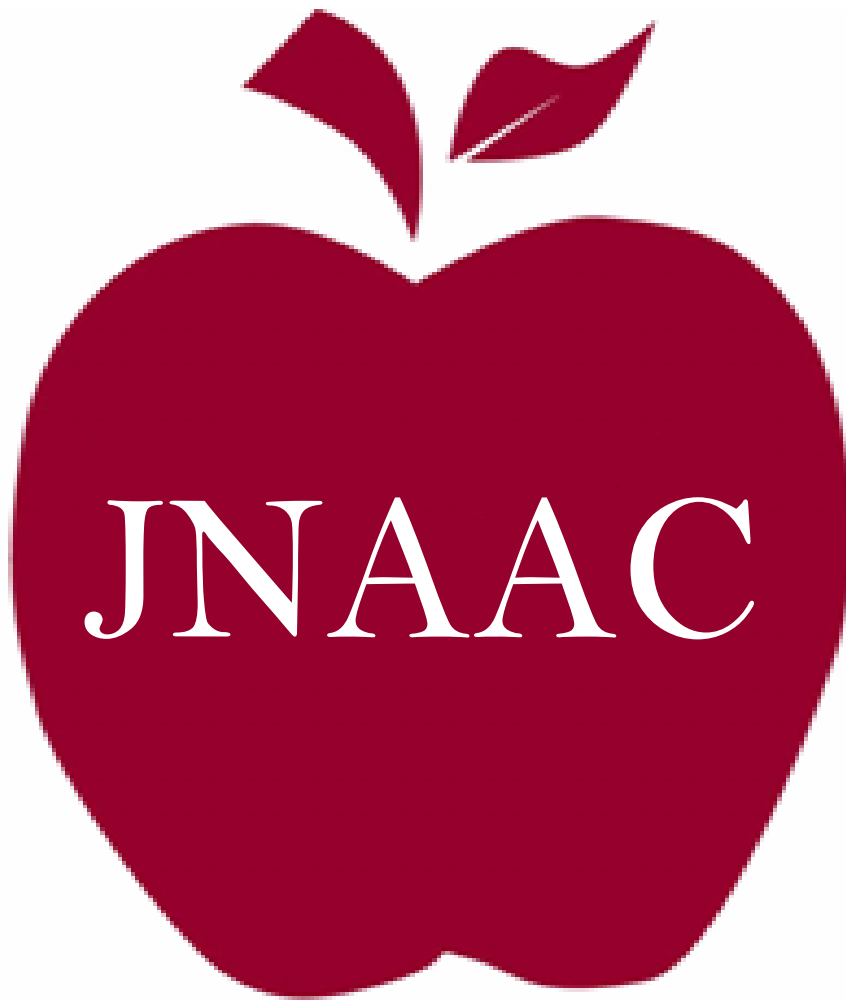


**Journal of the National Association for
Alternative Certification**



Volume 6, Number 1, Spring 2011

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Alternative Certification**

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Journal of the National Association for Alternative Certification

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Measuring Sense of Community and Perceived Learning Among Alternative Licensure Candidates

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Quantitative analysis was used to investigate relationships between sense of class community and perceived learning among alternative licensure candidates (N = 58) based on their scores from two separate standardized instruments measuring the constructs. Study results provide evidence that relationships do indeed exist and that differences between the two constructs can be identified within the data. Low correlations existed between the two constructs; correlations were higher for females than for males. There were no significant gender differences in either sense of community or perceived learning. Implications of these results are discussed and recommendations for further research are provided.

Key words: *sense of class community; perceived learning; alternative licensure*

A sense of community is important in any educational environment; it is fundamental to collaborative learning. Research by Glynn (1981) and Royal and Rossi (1997) indicates that common goals and values are essential elements of community. Strike (2004) theorizes that normation (the willingness of students to internalize group-shared expectations) is an important aspect of a learning community and helps to build a sense of connectedness. This can be particularly important among alternative licensure candidates who may come from a wide variety of backgrounds and life experiences.

Perceived learning is the amount of knowledge that students think they are learning as opposed to learning measured by grades, assessments, or test results. Ewell, Lovell, Dressler, and Jones (1994) note that “there is a considerable literature concerned with establishing the validity of student self-reports about cognitive outcomes” (p. 23). Despite the lack of an agreed definition of learning, the idea of learning as acquisition and as participation has underpinned much educational thought (Sfard, 1998). Acquisition deals with the products of learning, e.g.,

knowledge, skills, attitudes, values, behavior, and understanding. Participation suggests involvement in a learning process.

An important aspect of alternative licensure programs is the perceived support candidates receive as they face the daunting challenges of transitioning into teaching. In a similar vein, alternative licensure candidates are going to have increased confidence if they perceive they are indeed learning from the courses that comprise their licensure program (i.e., they believe that what they are learning will have a positive effect in helping them achieve their goal of becoming a teacher). Rodriguez, Plax, and Kearney (1996) suggest affective learning subsumes student motivation and promotes greater student learning because “affective learning motivates students to engage in task-relevant behaviors” (p. 297).

A review of the literature reveals that previous studies have been conducted to measure the sense of community among diverse groups of learners. The majority of research that has been conducted on perceived learning has focused on cognitive learning, i.e., how much knowledge students consider they are learning, and have not included the other two components of the construct, i.e., affective and psychomotor learning. An overview of the literature reporting previous studies measuring sense of community and previous research on the measurement of perceived learning is presented below. No previous research was located that included both constructs; therefore, this study examines whether there may be a relationship between the sense of community and perceived learning at the individual student level and also investigates whether such a relationship exists among alternative licensure candidates.

Sense of Community

The concept of community has received considerable interest in recent years. McMillan and Chavis (1986) define sense of community as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (p. 9). They identify membership, influence, integration and fulfillment of needs, and shared emotional connection as the most important characteristics of sense of community. This sense of community is particularly important among students preparing for alternative licensure as the compacted format of their program along with the lifestyle change that is implicit in career switching can lead to stress and anxiety; a sense of community within the class may help relieve these pressures.

An educational community is a learning environment where collaboration is prevalent, diversity is incorporated, and individuals trust and respect each other. Community members share a vision, a common sense of purpose, and a common set of values. Rovai, Wighting, and Lucking (2004) theorize that sense of community in an educational setting includes two underlying dimensions, which one can label social community and learning community. Social community represents the feelings of the community of students regarding their spirit, cohesion, trust, safety, interactivity, interdependence, and sense of belonging. Learning community consists of the feelings of community members regarding the degree to which they share common values and the extent to which their educational goals and expectations are satisfied by

group membership. Research indicates that learning is assisted if students believe that they belong to the community, and interpersonal relationships are important in a community of learners. The less a person understands the feelings and behaviors of others, the more likely he or she will act inappropriately or insecurely and fail to gain acceptance within the community (Gardner, 1983). Alternative licensure candidates may benefit from being prepared in an environment that supports a sense of classroom community not only to enhance their own collaborative learning but also to understand the importance of developing community among the children they will be teaching. Previous studies (e.g., Rovai & Wighting, 2005; Wighting, 2006; Wighting, Liu, & Rovai, 2008) have measured sense of community among diverse groups of students, but no research was located that measured sense of community in alternative licensure candidates.

Perceived Learning

Educators and researchers measure learning based on cognitive, affective, and/or psychomotor change. Dumont (1996) and Hiltz and Wellman (1997) report that use of student grades is the most prevalent measure of cognitive learning outcomes. However, using grades to operationalize learning may not always provide the best results. Classroom test grades or final course grades, particularly for graduate university courses, tend to have very restricted ranges, i.e., they tend to reflect uniformly superior achievement, thus limiting their use in any correlational study. Grades can have little relationship to what students have learned. For example, students may already know the material when they enroll or their grade may be more related to class participation than to learning. Grades may not be a reliable measure of learning, particularly for performance tests, as different teachers and even the same teacher at different times will likely not assign grades in a consistent manner.

In contrast, research evidence suggests self-reports of learning, or perceived learning, can be a valid measure of learning. Pace (1990) supported the validity of student self-reports of learning based on research evidence that suggested the consistency of results over time and across different populations. However, the emphasis has been on measuring cognitive change. Since learning can involve cognitive, affective, and psychomotor components, measurement of all three domains is required in order to measure perceived learning. Measurement of perceived learning among adult learners is just as important as it is among younger students. Most alternative certification candidates are preparing to embark upon their second or third career, and it is important for their instructors to know how much information the candidates perceive they are learning at an early or mid-point of their program (i.e., while there is still time available to modify the instruction if necessary).

Purpose

A review of the literature did not reveal any studies that had measured and investigated relationships between sense of community and perceived learning. This study measures both these constructs in order to obtain greater insight into possible relationships. The purpose of the

study is to measure and examine the two constructs and to respond to the following research questions:

- Does a relationship exist between sense of community and perceived learning?
- Do any significant differences exist between male and female alternative licensure candidates in either sense of community or perceived learning?

Methodology

Participants

A nonrandom sample of 58 alternative licensure candidates (ages 26-57 years) from intact classes participated in the study. Forty were female and 18 were male. A volunteer rate of 94% was achieved. The participants were enrolled in alternative teaching licensure orientation classes and average class size was 28. The student population was diverse, and included a number of students from different American cultures and ethnic backgrounds, primarily Caucasian and African-American. This study, however, did not attempt to investigate differences associated with age or ethnicity. Participants are drawn from a variety of previous career backgrounds, including 31 from business, 15 from marketing, and eight military retirees; no attempt was made in this study to correlate previous background with other data.

Setting

The sample comprised candidates enrolled in an alternative licensure program in an independent university in southeastern Virginia. Students in this program are being prepared to transition into a new career to teach high-need subjects in public or independent middle or high schools. The coursework is primarily face to face, and the majority of the courses include a practicum component that requires students to visit local middle and high schools to work on practical assignments.

Instrumentation

The Classroom and School Community Inventory (CSCI) was used to measure the students' sense of community. This instrument is available online at www.regent.edu/acad/schedu/pdfs/classroom_school_community.pdf together with a description of its development. Rovai, Wighting, and Lucking (2004) provide comprehensive evidence of validity and reliability for both the classroom form of the instrument (measures sense of community in a specific class) and the school form (measures sense of community in the whole institution).

The CAP Perceived Learning Scale was the instrument used to measure the students' perceived learning. This instrument is also available online at <http://dx.doi.org/10.1016/j.iheduc.2008.10.002> together with its developmental background. Rovai, Wighting, Baker and Grooms (2009) provide evidence of the instrument's validity and

reliability to measure perceived cognitive, affective, and psychomotor learning in traditional and virtual higher education classroom settings.

Results

The purpose of the current study is to (a) examine if a relationship exists between sense of community and perceived learning and (b) investigate if any significant differences exist between males and females in either sense of community or perceived learning. The focus of the first question was to determine whether a relationship existed between students' sense of community and sense of perceived learning in order to assist instructors of alternative certification students as they prepare to transition into teaching. The second research question addresses whether the community or perceived learning data revealed any significant differences between male and female alternative licensure candidates. In response to the first research question, to investigate whether a relationship exists between sense of community and perceived learning, a statistical correlation test was conducted and the results are shown in Table 1.

Table 1

Bivariate Relationship Between the Two Constructs

Variables	Sense of Community	Perceived Learning
<i>All participants (N = 58)</i>		
Sense of Community	1.00	
Perceived Learning	.29**	1.00
<i>Females (n = 40)</i>		
Sense of Community	1.00	
Perceived Learning	.47**	1.00
<i>Males (n = 18)</i>		
Sense of Community	1.00	
Perceived Learning	.28**	1.00

Note: ** Correlation is significant at the 0.05 level (2-tailed).

Table 1 reflects that there is a low correlation between sense of community and perceived learning, $r(58) = .29$, $p < .001$ using interpretations of the size of correlation coefficients as defined by Hinkle, Wiersma, and Jurs (2003). In order to address the second research question that investigates possible gender differences in correlations between sense of community and perceived learning, the data were split accordingly and a statistical correlation was conducted separately for females and males. The results shown in Table 2 reveal that there is a statistically

significant correlation between sense of community and perceived learning for both females and males. Interestingly, the correlation is higher for females than for males. The correlation for females is defined as being moderate, $r(40) = .47, p < .001$, whereas the coefficient for males is low, $r(18) = .28, p = .004$.

Table 2

Means of Females and Males: Sense of Community and Perceived Learning

Variables	Female	Males
<i>Sense of Community</i>		
Item 1	3.06	3.18
Item 2	3.25	3.10
Item 3	3.25	3.25
Item 4	3.19	3.21
Item 5	3.30	3.23
Item 6	2.72	2.88
Item 7	3.19	3.26
Item 8	2.82	2.84
Item 9	3.19	3.37
Item 10	2.95	2.79
Total	30.92	31.11
<i>Perceived Learning</i>		
Item 1	4.83	4.41
Item 2	4.97	4.78
Item 3	4.53	4.85
Item 4	4.86	4.64
Item 5	4.59	4.64
Item 6	4.50	4.52
Item 7	4.50	4.53
Item 8	4.58	4.52
Item 9	4.51	4.72
Total	41.87	41.61

Table 2 reflects the mean scores for both instruments disaggregated by gender. An independent samples t-test was conducted to investigate possible differences between males and females in either sense of community or religious commitment. The results of the t-test did not reveal any statistically significant differences between males and females in either sense of community or their perceived learning.

Discussion

The two research questions addressed in this small-scale study are (a) to examine if a relationship exists between sense of community and perceived learning and (b) to investigate if

any significant differences exist between males and females in either sense of community or perceived learning. In response to the first question, the results do reveal a positive relationship between sense of community and sense of perceived learning; a low correlation exists between the two constructs. What is less clear, however, is causality i.e., which of the two constructs is predominant, or whether they might be equally interdependent. It is recommended that future research might investigate causality to determine to whether one (i.e., sense of community or perceived learning) tends to significantly impact the other.

The second research question reveals that, in addition to the significant relationship between sense of community and perceived learning, the correlation is much higher for females than for males. This gender difference could be important to instructors of alternative licensure courses. As a connection could exist between sense of community and perceived learning among a group of alternative licensure candidates, the instructor could foster the sense of community (with its identified relationship to perceived learning) and ensure that instruction is organized in ways that encourage female and male interaction. Females can be given roles that promote the facilitation of a sense of community so that it benefits the learning environment for both genders in an alternative licensure program.

Limitations

A limitation of this study is the self-report nature of the questionnaires employed in this study. It is recognized that subjects taking part in research studies involving self-report instruments are often reluctant to report negative experiences. The results of this research can only be generalized to a similar population of participants. The students in this study were all enrolled in an alternative licensure program and the results may not apply to students enrolled in other programs.

Conclusions

Alternative certification administrators and instructors can benefit from the implications of this study. First, a positive correlation has been found to exist between the sense of community and perceived learning. This relationship could be linked to actual learning, and instructors may find that to collect data on these two constructs could be very helpful in adding to their knowledge of individual students and how they work and learn collaboratively. This study has also shown that the correlation is stronger among females than among males, and instructors may wish to structure collaborative learning among alternative licensure candidates in ways that benefit from this.

Future research can build upon the present small-scale study by replicating the research with a larger sample size and in more diverse settings. It is recommended that further studies into the various relationships between sense of community and sense of perceived learning be conducted in alternative licensure programs. For example, a study that investigates differences among alternative certification students preparing to teach at different grade levels, e.g., middle school compared to high school, might reveal results that could be helpful to administrators. A

study that focuses on an investigation of possible ethnic differences might be very useful to alternative licensure programs in regions with a high proportion of Hispanic or African-American students transitioning into teaching. Further studies into the gender differences found in this study are also recommended. A mixed method design that incorporates a qualitative component may provide deeper insight into students' sense of community and perceived learning.

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Comparison of Alternative and Traditional Teacher Preparation Programs for First Year Special Education Teachers in Northwest Ohio

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This study compares knowledge as measured by grade point averages and Praxis II scores between first-year special education teachers who completed one university's alternative teacher preparation program (ATTP) and those who completed the university's traditional teacher preparation program (TTPP). A total of 33 teachers, 15 from the ATTP and 18 from the TTPP participated in the study. Findings indicate that teachers from both programs had similar outcomes on the Praxis II licensure exam and final grade point averages. Although the sample was small, findings of this study indicate that both programs adequately prepared teachers to work with special education populations.

Key Words: *Special education; Teacher preparation; Praxis II; Alternative & traditional; Academic outcomes*

Cochran-Smith and Power (2010) cited 10 trends that indicate the direction of teacher preparation is changing from the traditional baccalaureate teacher education programs to alternative routes to becoming fully-licensed teachers. These trends include: (a) linking teacher preparation, teacher quality, and the economy, (b) recognition of teacher-quality gap, (c) accountability for student learning outcomes, (d) statewide data systems linking teachers, students, and preparation, (e) more widespread performance assessments of teacher candidates, (f) *proliferation of multiple routes into teaching*, (g) school district-based teacher residency programs, (h) practice as the center of teacher preparation, (i) teachers as researchers, and (j) preparation to teach diverse learners.

The purpose of this study was to compare content knowledge in special education and instructional methodology as measured by grade point averages and scores on the Praxis II subject assessment in a specific content area (i.e., special education) between first-year teachers who have completed an alternative program for special education for students with mild to moderate educational needs and first-year teachers who have completed a traditional program for special education for students with mild to moderate educational needs.

While all participants in the study were employed previously as teachers, they were not working in special education programs prior to completing their teacher preparation programs. Prior to becoming licensed as intervention specialists, the teachers had to successfully complete either the alternative or traditional program at The University of Toledo and successfully pass the Praxis II exam.

According to Hecker (2001), special education teachers are considered to be one of the fastest growing occupations in the United States. The number of special education teachers is expected to increase from 473,000 in 2002 to 554,900 in 2018 (Bureau of Labor Statistics, 2010). The additional 81,900 special education teachers who will be needed by 2018 represent a 17% growth rate in the field. Because of the need for a greater number of special education teachers nationwide, alternative teacher preparation programs have been developed by universities working with local school districts or state boards of education.

Related Literature

According to researchers (Nougaret, Scruggs, & Mastropieri, 2005; Sindelar & Rosenberg, 2000), a growing source of licensed special education teachers is alternative teacher education programs. The presence of alternative teacher preparation programs is increasing due to the imbalance in the supply and demand of special education teachers. Alternative teacher preparation programs are increasing to meet the needs of nontraditional students who are returning to the classroom to become certified teachers (Feistritzer, 2001). Some alternative teacher preparation programs focus on increasing diversity (e.g., race, ethnicity, and gender) in the teaching profession (Grossman & Loeb, 2010). According to Harrell, Harris, and Jackson (2009), the number of states allowing alternative teacher education programs have increased from 8 in the 1980s to all 50 states.

Most alternative teacher preparation programs are intended to meet the demands for teachers in high need areas (e.g., mathematics, science, special education, etc.). According to Clarke and Thomas (2009), Georgia State University has had a nontraditional approach to certification in mathematics secondary education since 1996. The University of Toledo began an alternative program for special education teachers to meet the demands for special education teachers in Northern Ohio.

However, some concerns have been raised regarding the quality of the graduates of alternative teacher preparation programs nationally. Some alternative teacher preparation programs have been designed for older, nontraditional students who have bachelor degrees in education (Sindelar & Rosenberg, 2000; Zeichner & Schulte, 2001). Research results have been mixed, suggesting that programs vary substantially across program content, with little known about completion rates and teacher performance (Nougaret et al., 2005; Rosenberg & Sindelar, 2005)

State legislatures, federal courts, and the United States Congress have passed laws that have increased educational options for children with disabilities. Children who previously had been excluded from public school programs now were included in the least restrictive environment. The foundation for implementing and maintaining effective special education

services resulted from federal and state laws and mandates. Two landmark pieces of legislation had profound effects on special education.

Public Law 94-142, passed by Congress in 1975, guaranteed a free, appropriate public education to all children with disabilities in the least restrictive environment. Reauthorized in 1990, 1997, and 2005, the law was renamed the Individuals with Disabilities Education Improvement Act (IDEA) and expanded school district responsibilities for providing special education services. IDEA includes key principles to guide families and professionals to work collaboratively and enhance educational opportunities for children with disabilities.

The second legislation, the No Child Left Behind (NCLB) Act of 2001 became law in 2002. This law requires students with disabilities to participate in annual assessments, with their scores disaggregated to provide information to the public regarding their progress. Both IDEA and NCLB are considered important legislation in meeting the needs of students with disabilities and in providing an adequate supply of highly qualified special education personnel. For a comparison of NCLB and IDEA, see Table 1.

Table 1

NCLB/IDEA Comparison on Key Topics

	NCLB	IDEA
Participation in assessments	Annual assessments in all grades tested must be administered with appropriate accommodations, guidelines, and alternate assessments for all students covered by IDEA.	Students with disabilities must be included in all state and local assessments using appropriate accommodations or through alternate assessments.
Adequate yearly progress	States must submit a plan to demonstrate that they have adopted challenging academic standards for all students and the school district must use academic assessments described in their plan to annually review the progress of each school to determine whether the school is making adequate yearly progress.	There is no corresponding language regarding AYP in IDEA.
Highly qualified teachers	Defines “highly qualified” as any public school teacher who has a bachelor’s degree, holds state certification, and demonstrates subject matter competency (test or high objective uniform state standard of evaluation [HOUSSE] document).	Uses the term “qualified personnel” which means personnel who have met state approved or recognized certification, licensing, registration, or other comparable requirements in the area in which the individuals are providing special education or related services.

Note: Cole, 2006, p. 6

Special education teachers were required to meet the highly qualified requirements by the end of the 2005-2006 academic year. These requirements included: (a) holding at least a bachelor’s degree, (b) holding full state certification or licensure as a special education teacher, and (c) demonstrating subject matter competence in each area taught for special education teachers in 7th through 12th grades (S. Zake, personal communication, 2005). The NCLB and

IDEA teacher requirements apply regardless of where a special education teacher provides instruction (e.g., core academic subject in a regular classroom, a resource room, or any other setting). NCLB and IDEA requirements regard competence in core academic subjects as more important than teaching in a particular instructional setting (California Department of Education, 2010).

IDEA recognized that many students with disabilities can and will meet standards at a proficient level, however more time and additional accommodations may be needed to master the standards. In contrast, a major premise of NCLB is that all students must attain proficiency on state-mandated standards at the same time and level. In addition, NCLB also mandates that all students at certain grade levels will test proficient on state standards (Reder as cited in Cole, 2004). Congress, in reauthorizing IDEA, attempted to align the law with requirements of NCLB. The alignment of NCLB and IDEA are presented in Table 1. These laws support projects that demonstrate how states and local school districts can meet challenges associated with staff recruitment, retention, and personnel preparation successfully.

Alternative Teacher Preparation Programs

While variations exist in alternative teacher preparation programs, some commonalities exist, including (a) nature of the provider, (b) response to labor market needs, (c) coursework, and (d) recruitment and selection. Most alternative teacher preparation programs are based on partnerships among institutions of higher education, private providers, and school districts. The programs are established to meet a niche in the labor market (e.g., specific high need shortages for mathematics, science, and special education teachers). While the programs have variations in regard to the scope and sequence within the curriculum and field work, they have to meet state and national certification standards. The alternative teacher preparation programs have been successful in attracting a new pool of students who had decided to become educators. These alternative teacher preparation programs are attractive to students because they can be completed at convenient times and locations, have reduced requirements when compared to traditional programs, provide tuition assistance through government grants, and have increased mentoring for new teachers.

The Intervention Specialist Institute (ISI) at The University of Toledo is an alternative route to certification that was created to prepare highly qualified, skilled intervention specialists who teach students with mild to moderate disabilities and help them succeed in a variety of learning environments (Welch & Devlin, n.d). The increased focus on special education through legislation has created a need for more certified/licensed intervention specialists who can meet requirements of both NCLB and IDEIA. Alternative routes to certification (ARC) in special education have become a viable way to obtain the necessary education, skills, and knowledge to become a certified/licensed intervention specialist. Numerous ARC programs exist, especially in states where school districts have difficulty recruiting highly qualified special education teachers. Institutions of higher education (IHE) in partnership with state and local education agencies provide ARC programs that incorporate coursework with field work that includes mentoring and supervision. Because of the diversity in these programs and the lack of a consistent definition of ARC, the quality of special education teachers emerging from these programs is unclear (Rosenberg & Sindelar, 2005).

Some features of ARC programs appear to be similar to traditional teacher preparation programs. For example, IHE involvement in ARC programs is considerable, nationally recognized teaching standards provide the basis for these programs, specific sequences of coursework are required, fieldwork that involves supervision and mentors is an essential part of ARCs, and admission criteria is selective (Rosenberg, Boyer, Sindelar, & Misra, 2007). Research on ARC programs for certification/licensure for special education teachers is limited. Studies on student achievement have found that teacher certification/licensure is the most important measure of teacher quality (Darling-Hammond, 2000). ARC programs generally are transient, with universities in states experiencing shortages initiating these programs and then phasing them out as shortages are mitigated or funding becomes less available.

A need exists to study the efficacy of ARC programs in producing special education teachers who can provide high quality, effective instruction to children with mild to moderate disabilities. Research is needed to compare completers of ARC and traditional teacher education programs on subject-area knowledge as measured by their program grade point averages and their scores on the Praxis II. The research question that will be addressed in this study is:

Does content knowledge of basic special education principles as measured by the Praxis II scores and program grade point averages differ significantly between intervention specialists who have completed the alternative teacher preparation program and those who have completed the traditional teacher preparation program?

Participants

Participants in the study were completers of two teacher preparation programs at The University of Toledo in 2005-2006. The participants had been licensed/certified general education teachers prior to becoming intervention specialists. A total of 23 teachers had completed the alternative teacher preparation program and 24 teachers had completed the traditional teacher preparation program. Of this number, 33 teachers, including 15 from the alternative teacher preparation program and 18 from the traditional teacher preparation program, completed and returned their surveys for a response rate of 70.2%. The largest group of teachers ($n = 10$, 30.3%) were between 36 and 40 years of age, female ($n = 27$, 81.8%), and Caucasian ($n = 27$, 84.4%) (see Table 2).

Measures

Demographic survey. A short demographic survey was completed by the participants to collect data on the personal and professional characteristics of the participants. The items on this survey used forced-choice categorical responses.

Praxis II. The Praxis II Special Education: Knowledge-Based Core Principles (0351) examination measures content knowledge of basic principles of special education. According to ETS testing materials, extensive knowledge of individual specialty areas (e.g., education of students with visual impairments) is not required. Educational Testing Service designed the Praxis II exam that is administered after completion of a teacher education program. This test

was previously known as the National Teacher Examination. The Ohio test includes 60 multiple-choice response items that measure three content categories:

- I. Understanding Exceptionalities (n = 15)
- II. Legal and Societal Issues (n = 8)
- III. Delivery of Services to Students with Disabilities (n = 37).

Scoring on the Praxis II is accomplished by first obtaining a raw score that is the number of correct responses. A scaled score is then calculated that weighs the items by the difficulty of the question. According to Dr. Richard Welsch (personal communication, August 9, 2007), the minimum qualifying score for the intervention specialist (mild/moderate, K-12) licensure was 151.

Table 2

Cross Tabulations: Personal Characteristics of the Teachers (N = 33)

Personal Characteristics	<u>Type of Teacher Preparation Program</u>					
	<u>Alternative</u>		<u>Traditional</u>		<u>Total</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
<u>Age</u>						
21 to 25	2	13.3	3	16.7	5	15.2
26 to 30	1	6.7	5	27.8	6	18.2
31 to 35	2	13.3	3	16.7	5	15.2
36 to 40	7	46.7	3	16.7	10	30.3
41 to 45	2	13.3	2	11.1	4	12.1
46 to 50	1	6.7	1	5.5	2	6.0
Over 50	0	0.0	1	5.5	1	3.0
<u>Gender</u>						
Male	3	20.0	3	16.7	6	18.2
Female	12	80.0	15	83.3	27	81.8
<u>Ethnicity</u>						
African American	0	0.0	2	11.1	2	6.3
Caucasian	11	78.6	16	88.9	27	84.4
Hispanic	2	14.3	0	0.0	2	6.3
Other	1	7.1	0	0.0	1	3.0
Missing	1					
<u>Educational Level</u>						
Bachelor's Degree	12	80.0	16	88.9	28	84.8
Master's Degree	3	20.0	2	11.1	5	15.2

Grade Point Average. Cumulative grade point averages (GPAs) were obtained from student records at The University of Toledo. The GPAs were on a traditional 4-point scale, with a 4.0 indicating an A average.

Data Analysis

The data were analyzed using SPSS – W. The demographic characteristics were analyzed using cross tabulations to compare participants who had completed the alternative teacher preparation program and those who had completed the traditional teacher preparation program. The research question was addressed using t-tests for two independent samples and t-tests for one sample.

Findings

Description of the Samples

The teachers in both the alternative and traditional teacher preparation programs reported completion of a bachelor's degree prior to their entry into their Intervention Specialist Licensure programs, with 3 (20.0%) in the alternative teacher preparation program and 2 (11.1%) in the traditional teacher preparation program indicating they had also completed a master's degree (see Table 2). The teachers in the study had worked in education as licensed teachers from 1 to 21 years, with work in special education ranging from 0 to 6 years. Twenty-six (83.9%) of the responding teachers were fully licensed as intervention specialists, with licensure pending for four program completers. The type of licensure was either two-year provisional ($n = 11$, 38.0%), five year provisional ($n = 9$, 31.0%), or "other" ($n = 9$, 31.0%). Some graduates of both the alternative teacher preparation program and the traditional program were working in other states and the exact type of licensure was not provided. Some types of disabilities on the intervention specialists' caseloads included cognitive disabilities, speech/language impairments, other health impairment, specific learning disabilities, orthopedic impairment, and autism. The teachers were working across the grade levels from pre-K to twelfth grade.

The results of the t-tests for two independent samples that compared Praxis II scores of teachers in the alternative teacher preparation program ($M = 164.13$, $SD = 11.77$) and teachers in the traditional teacher preparation program ($M = 168.13$, $SD = 10.91$) were not statistically significant ($t(46) = -1.22$, $p = .228$). This result indicated that students, regardless of which program they had completed, had similar scores on the Praxis II.

The comparison of students' cumulative grade point averages was not statistically significant ($t(46) = -.04$, $p = .967$). Based on this finding, the mean scores for teachers in the alternative teacher preparation program ($M = 3.76$, $SD = .31$) were similar to those attained by teachers in the traditional teacher preparation program ($M = 3.77$, $SD = .18$; see Table 3).

A second analysis used t-tests for paired samples to determine if the scores on the Praxis II attained by the teachers in the alternative and traditional teacher preparation programs were significantly above the Ohio Board of Education's (2006) required minimum score of 151. The mean score of 164.13 ($SD = 11.77$) attained by the teachers in the alternative teacher preparation program was significantly higher than the required minimum score of 151 ($t(23) = 5.46$, $p < .001$). In addition, teachers in the traditional teacher preparation program ($M = 168.13$, $p < .001$) had statistically significant higher scores on the Praxis II than the Ohio minimum standards ($t(23) = 7.69$, $p < .001$) (see Table 4).

Table 3**t-Tests for Two Independent Samples: Praxis II Scores and UT Grade Point Averages**

Group	Number	Mean	SD	DF	t-Value	Sig
Praxis II						
Alternative	24	164.13	11.77	46	-1.22	.228
Traditional	24	168.13	10.91			
UT Grade Point Average						
Alternative	24	3.76	.31	46	-.04	.967
Traditional	24	3.77	.18			

Table 4**t-Tests for One Sample: Praxis II Scores**

Group	Number	Mean	SD	DF	t-Value	Sig
Alternative teacher preparation program	24	164.13	11.77	23	5.46	<.001
Traditional teacher preparation program	24	168.13	10.91	23	7.69	<.001

Test Statistic – Ohio Minimum Passing Score of 151

Discussion

In areas of critical teacher shortages (e.g., special education, mathematics, science), alternative teacher preparation programs are being used to prepare teachers in these areas. According to the report, “Tables and Figures for the 2007 Condition of Teacher Supply and Demand in Ohio” (Driscoll & Fleeter, 2007), the problem in Ohio is not a shortage of fully licensed teachers, but, rather, it is an imbalance between critical teacher shortage areas (special education, mathematics, and science) and general education. The shortages are especially critical in urban and rural areas and in schools with high enrollments of poor and minority students.

Effective intervention specialists need both knowledge of their content area and knowledge of strategies to teach the content to students with mild to moderate disabilities (Sindelar, Bishop, Brownell, Rosenberg, & Connelly, 2005; Hill, Rowan, and Ball, 2005). Where previous research has been mixed regarding the efficacy of these programs to produce teachers who were effective in the classroom, the present research found that teachers from both alternative and traditional teacher preparation programs had similar outcomes on Praxis II and academic grade point averages. In general, the Praxis II exam measures content knowledge, including environment, knowledge of specific subjects that K -12 educators are expected to teach, and principles of learning and teaching. The exam completed by the participants in the present study focused on special education topics, including understanding exceptionalities, legal and societal issues, and delivery of services to students with disabilities.

Completers in both groups had significantly higher total scores on the Praxis II than the

required passing score of 151 for intervention specialists seeking licensure in the state of Ohio. Based on these findings, it appears that teachers who completed the alternative teacher preparation program were performing at the same levels as teachers from the traditional teacher preparation program. The findings of the present study provide an objective examination of knowledge (as determined by Praxis II scores and grade point averages) and support that both programs are producing intervention specialist teachers who have similar knowledge of special education processes.

The teacher preparation programs differed in that the alternative teacher preparation program was afforded more intense mentoring and supervision. A mentor was defined as an experienced classroom teacher who helped and supported first-year teachers. The alternative teacher preparation group participated in a series of workshops (1 credit per semester) that included a supervision and mentorship component as well as instruction in preparing and writing Individualized Education Plans (IEPs). A key feature of the supervision and mentorship support in the alternative teacher preparation program was the ongoing collaborative partnership between the university and local school district personnel. Ongoing supervision and mentoring was provided to participants by both university program faculty and on-site school district personnel. Teachers in the alternative teacher preparation program had visits from the school district mentor at least once every 2 weeks during the first 10 weeks in the special education classroom, with a minimum of 4 additional classroom visits over the next 20 weeks of teaching. Additionally, participants received on-site supervision, ongoing telephone and email support from university program faculty as requested by the teacher or supervisor. Four on-campus group meetings were offered throughout the year for the alternative teacher preparation program completers. Table 5 provides the core differences between the traditional and alternative teacher preparation programs.

Table 5

Comparison of Program Characteristics between Alternative Routes to Certification and Traditional Programs for Special Education Teachers

Alternative Route to Certification/Licensure	Traditional Teacher Preparation Programs
24 semester hours	30 semester hours
Cohort group	Individual scheduling
Completed in 3 semesters	Completed in 4 semesters (minimum)
Minimum 240 clock hours of job-embedded field work	Minimum 255 clock hours of field work
On-the-job mentoring and supervision of teaching over academic year	Traditional student teaching after content/methods coursework
Saturday/Sunday classes once a month, webct synchronous and asynchronous communication, evening workshops once a month, 2-week summer institutes	Evening classes (Monday through Thursday) on 16-week terms, minimal webct supported instruction
Tuition support through state grant	Some scholarships, graduate assistance

The findings of this study support the efficacy of The University of Toledo alternative teacher preparation program, conducted in collaboration with local school districts, in preparing teachers to work as intervention specialists. As a critical shortage exists for special education, the use of alternative teacher preparation programs to provide the education and experience to teach in this area appears to be a viable way to provide qualified teachers to fill the need. However, additional research is needed to replicate the findings of this study.

Recommendations

Administrators in school districts should continue to encourage high quality general education teachers from these areas who have demonstrated successful teaching in the past to participate in alternative teacher preparation programs to become intervention specialists. These teachers could obtain an add-on licensure area to enhance their employment opportunities.

Potential teachers who are considering alternative pathways to certification need to consider the type of program. They need to communicate with their State Boards of Education to determine if the program can lead to either certification or licensure. In addition, they need to ensure that the program is recognized by their local boards of education.

The curriculum of the alternative teacher preparation programs also should be closely scrutinized by potential teachers. If the individual already holds a bachelor's degree, he/she may want a program with extensive field work with students. Others may need additional coursework to update their content knowledge. Many alternative teacher preparation programs can custom tailor their requirements to meet the needs of the potential teacher, but others offer a standard curriculum that may not prepare teacher candidates adequately to pass state licensure exams or work effectively with students.

To meet requirements of federal and state mandates associated with highly qualified teachers in core curriculum areas, intervention specialists will need to obtain add-on teaching certification or licensure in one or more core curriculum areas. Alternative and traditional teacher preparation programs will need to be restructured to incorporate the necessary subject-area content with effective instructional strategies for students with disabilities (Ohio Department of Education, 2005). These programs need to add content area curriculum in areas taught (e.g., English language arts) by intervention specialists who are assigned to 7th through 12th grade programs.

The university and urban school districts involved in the development of the alternative teacher preparation program need to formalize their mentoring programs to provide continued support for new intervention specialists. These programs have been shown to be effective in providing general education teachers who are moving into special education with the support they need when faced with difficult situations (Darling-Hammond & Sykes, 2003). The mentors could be professors and experienced special education teachers who could provide coaching and supervision for inexperienced teachers.

Continued research is needed on alternative teacher preparation programs to determine if teachers from alternative teacher preparation programs develop the same types of skills and strategies as teachers from traditional teacher preparation programs. Additional research could use a qualitative research design to determine the extent to which teachers from alternative teacher preparation programs feel their programs prepared them to be effective intervention specialists and what areas in these programs need to be strengthened to help them achieve success when working with students with mild to moderate disabilities.

An important consideration of teacher preparation programs is assessing the effectiveness of the program on the end users, students with disabilities. By measuring and evaluating student outcomes using standardized test scores and alternative assessment procedures (e.g., portfolios, etc.), the efficacy of teacher preparation programs can be determined.

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Comparison of Alternative and Traditional Teacher Certification Programs in Terms of Effectiveness in Encouraging STEM Pre-Service Teachers to Teach in High Need Schools

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***Abstract:** Central to the debate regarding the effectiveness of alternative and traditional teacher certification programs is the question of providing high quality teachers for high need schools. The Robert F. Noyce Teacher Scholarship Program, funded by the National Science Foundation, supports both alternative and traditional routes to teacher certification nationwide and has similar requirements for all teacher candidates. It, therefore, provided a unique opportunity to compare alternative and traditional programs in terms of their perceived effectiveness in encouraging potential STEM teachers to teach in high need schools. Data came from a comprehensive, mixed methods evaluation of the Noyce Program and included 434 surveys completed by Noyce scholars, and 19 interviews with school district representatives. Comparisons between alternative and traditional programs were made based on scholars' demographics, affective characteristics, background experiences, and beliefs about teaching. Results demonstrated that Noyce scholars from alternative and traditional programs were similar in*

demographic and most affective characteristics but different in background experiences and beliefs about teaching. Moreover, the data suggest that alternative routes might attract more candidates who are more likely to teach in high need schools.

Key Words: *Alternative certification, traditional teacher preparation, STEM teachers, high risk schools.*

There is a debate in the teacher certification literature regarding the effectiveness of alternative and traditional teacher certification programs in producing highly qualified teachers. Providing high quality teachers for high need schools is paramount for teacher training programs because there is a lack of highly qualified teachers to staff the increasing numbers of high need schools (Ingersoll, 2001, 2002). Several legislative efforts have been proposed to help provide more highly qualified teachers for high need schools. Examples of these include a reauthorized Academic Improvement and Teacher Quality programs' office and the allocation of specific funds to alternative certification programs. Both of these are under *Title II*, and part of the No Child Left Behind Act of 2001 (No Child Left Behind Act, 2001). A third example is the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act of 2007, which allocated funds to teachers intending to teach in high need settings as well as to teacher certification programs for licensure in the specific content areas of science, technology, engineering, and mathematics (STEM), and critical foreign languages (America COMPETES Act, 2007). A fourth example of a legislative effort occurred in 2009, in which the National Science Foundation's (NSF) Robert F. Noyce Teacher Scholarship Program (Noyce program) received specific funding under the stimulus package. The Noyce program commenced in 2002 and continues to provide funding for STEM teachers who are committed to teaching in high need schools for a specified amount of time. The fact that all of these efforts support both alternative and traditional teacher certification programs raises the question as to how different alternative and traditional programs are in their effectiveness for preparing quality STEM teachers for high need schools. Importantly, if both types of programs are equally effective in providing quality teachers that meet the pedagogical, content knowledge, and personal affective characteristic requirements of high need schools, then perhaps because alternative programs tend to be shorter and cost less, they might present a more efficient route to teacher certification. Other major concerns exist within the alternative pathways, such as retention of teachers in high need schools.

Both alternative and traditional certification programs have strong arguments supporting their implementation. A literature review conducted by Legler (2002) found that the main supporting argument for alternative programs is that they require less coursework and requirements before becoming the teacher of record; thus they make the teaching profession more accessible to career changers and candidates who are interested in teaching but do not have adequate funds to pay for prolonged education. Legler also found that alternative programs may increase the number of minority teachers, increase the number of teachers in shortage areas, produce teachers that demonstrate similar

classroom performance and student outcomes to traditionally certified teachers, and provide intensive mentoring and support, which contributes to the development of alternatively certified teachers.

However, the main supporting argument for traditional certification programs is that the extensive coursework, field experiences, and mentoring required before becoming the teacher of record produces teachers who are more qualified and confident about their preparedness to teach (Darling-Hammond, 2003). Similarly, Guyton, Fox, and Sisk (1991) found that teachers who had completed traditional certification programs were perceived by principals and themselves as better prepared to teach than those who had completed alternative certification programs. In addition, Darling-Hammond (1999) found that traditional certification programs seem to have higher entry and retention rates compared to alternative certification programs and that they actually cost less when considering the costs of certification, recruitment, induction, and replacement resulting from attrition.

However, arguments can be made against both types of programs. Negative aspects of alternative certification programs, summarized by Legler, are that alternative programs can allow unqualified people to assume total responsibility for classrooms; they give inadequate attention to curriculum development, pedagogical knowledge, and classroom management; and that their teacher candidates do not have the ability to learn content knowledge “on-the-job”. Furthermore, alternative certification programs do not increase the retention rate of teachers in comparison to traditional certification.

The main argument against traditional programs is that their additional requirements do not necessarily provide teachers who are better prepared for the classroom. For example, Hess (2001) drew attention to the fact that many traditional education programs do not have a screening process like other academic programs such as medicine or law, thus, they provide little protection against weak or incompetent pre-service teachers who complete the teacher preparation regime. Finn (2003) pointed out that alternative programs, such as Teach for America and Troops to Teachers, often prepare teachers who are just as capable inside the classroom as compared to others who went through more “professional” teacher certification programs.

To help elucidate the debate surrounding alternative and traditional teacher certification programs and to make more sound comparisons between the two, it is important to describe the characteristics and perceptions of preservice and in-service teachers who pass through these programs and determine any similarities and differences between them. In particular, Hess’s argument cited above regarding strong versus weak teacher candidates entering the profession highlights the importance of determining what type of teacher candidate each program attracts in order to make fairer comparisons between alternative and traditional programs. Furthermore, in these comparisons, it is necessary to pay particular attention to characteristics and perceptions that are known to be important in teacher recruitment, retention, and attrition.

It has been argued that studies comparing alternative and traditional programs may have yielded contradictory results because there are variations in the definitions for alternative and traditional teacher certification programs (Miller, McKenna, & McKenna, 1998; Tozer, O'Connell & Burstein, 2006). A commonly accepted definition for alternative programs is as follows:

Alternative programs vary from short summer programs that place candidates in teaching assignments with full responsibility for students after a few weeks of training to those that offer 1- or 2-year post-baccalaureate programs with ongoing support, integrated coursework, close mentoring, and supervision. (Darling-Hammond, Chung, & Frelow, 2002, p. 287)

A commonly accepted definition for traditional programs is as follows:

Traditional programs are generally offered through a college of education as four-year undergraduate degrees. A traditional teacher preparation program curriculum typically combines subject matter instruction, pedagogy classes, and field experience....Teachers in training typically go through a period of student teaching, which is generally unpaid, and often are required to take a battery of assessments before they receive their degrees. (US Department of Education, Office of Postsecondary Education, 2005, p. 6-7)

Using these definitions as a guide and capitalizing on when the teacher candidate becomes teacher of record, this study defined alternative programs as those that had their teacher candidates become teacher of record before or during the first half of their certification program. Accordingly, traditional programs were defined as those that had their teacher candidates become teacher of record after completing at least the first half of their certification program due to limitations of the survey response options as discussed in the conclusion.

The aim of this study was two-fold. The first was to compare teacher candidates enrolled in alternative and traditional programs on certain personal characteristics that pertained to their likelihood of being appropriate teachers in high need schools. These personal characteristics included sex, race/ethnicity, age, and affective characteristics because they have all been determined to be important variables related to high need schools (Haberman, 1995; McKinney, Berry, Dickerson, & Campbell-Whately, 2007; Salinas, 2002). The likelihood of being a good teacher is also influenced by level of commitment to teaching (Haberman, 1995); therefore, the teacher candidates were also compared on their commitment to become teachers as well as their commitment to teach in a high need setting. The second purpose of this study was to compare the teacher candidates on their perceptions of the effectiveness of their programs in preparing them to teach in high need schools.

Data for this study came from a comprehensive 4-year mixed methods evaluation of the Noyce program. The Noyce program is a nationwide teacher incentive-based program funded by the NSF and is aimed towards supplying highly qualified STEM teachers to high need schools. For the purposes of this study, “highly qualified teacher” was defined as those possessing a strong content background and having gone through a quality certification program. Also, the term “high need” indicated that the school met at least one of the Title II requirements for either teacher attrition rates, percentage of students eligible for free and reduced lunch, or percentage of teachers without a bachelor or graduate degree in the content area in which they did most of their teaching (No Child Left Behind, 2001).

The Noyce program supplies highly qualified STEM teachers to high need schools by partnering with teacher certification programs nation-wide and providing funding to teacher candidates. In turn, the teacher candidate fulfills a two-year requirement of teaching in a high need school for every year of support after completing his or her certification program. Thus, the evaluation of the Noyce program provided a unique opportunity to examine the similarities and differences among scholars enrolled in alternative and traditional certification programs because all of the teacher certification programs the Noyce program partnered with (a) received funding, (b) had similar high need teaching requirements of their candidates, and (c) selected only teacher candidates with high quality content knowledge in their proposed teaching area. Consistent with the aims of the study mentioned above, the two research questions were:

1. How do teacher candidates enrolled in alternative and traditional programs compare on selected personal characteristics?
2. How do these teacher candidates differ in their perceptions of their preparation programs?

Data Collection

Data Sources and Instruments

Data were collected from three sources: the ORC Macro International, Inc. Noyce program monitoring database (ORC database), Noyce scholars using web-based surveys, and school district representatives using structured interviews.

ORC database. The ORC database contained 1504 Noyce scholars, which is the entire population of Noyce scholars during the reporting period from 2003-2007. Data found in the ORC database were provided by the principal investigators (PI) and were entered during the 2003-2007 monitoring period. This database provided the sex, race, and content majors of the scholars.

Scholar survey. The web-based scholar survey contained six sections. Items included questions about what influenced them to become teachers, and perceptions about their teacher certification programs. The survey was customized so that the items would be applicable to scholars in different stages of their careers (e.g., still enrolled as a

student, graduated and teaching, etc.). Four hundred thirty four of the 555 survey responses could be matched with the ORC database and were used for this study.

Factors identified on the survey. Due to the large number of items in the scholar survey (83 items), it was important to combine and reduce the survey items into factor scores for analysis. Through a cross-validation study, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to identify underlying conceptual constructs/factors and create factor scores to represent the survey responses. More detailed information about the EFA and CFA procedures can be found in Kirchoff, Lawrenz, and Bowe (2010) and Bowe, Liu, and Lawrenz (2009).

The EFA and CFA showed that the scholar survey contained eight factors that measured some aspect of the scholars' background experience, commitment to teaching, beliefs about teaching, and perceptions regarding the effectiveness of their certification programs. These factors were called: (a) influence of the Noyce program on scholars' commitment to become a teacher, (b) influence of the Noyce program on scholars' commitment to teach in a high need school, (c) preparation for high need schools, (d) path to teaching, (e) district/school high need environment, (f) personal beliefs towards teaching, (g) school teaching environment, and (h) mentoring experience. Factor scores for these eight factors were created and used in the analyses. The factor scores were standardized on a normal distribution with a mean of zero and a standard deviation of one.

Explanation of factors. The first factor, influence of the Noyce program on scholars' commitment to become a teacher, included three items that measured the scholars' perceived commitment to becoming teachers. The higher the score, the more influence the scholars perceived the funding had on their decisions to enter the teaching profession, therefore the less committed they were to becoming teachers before being a part of the Noyce program. The second factor, influence of the Noyce program on scholars' commitment to teach in a high need school, included three items that measured the scholars' perceived commitment to teaching in a high need school. The higher the score, the more influence the scholars perceived the Noyce funding had on their decisions to teach in a high need school, therefore, the less committed they were to teaching in a high need school before being a part of the Noyce program.

The third factor, preparation for high need schools, included the scholars' responses to 13 items regarding how prepared they felt for teaching in a high need school. The higher the score, the more prepared scholars felt for teaching in high need schools. The fourth factor, path to teaching, included the scholars' responses to seven items regarding various aspects of courses they took, at what time in their academic or career life they decided to become teachers, and their previous career status. The higher the score, the older they were, the more STEM classes they would have taken, and the more likely they would have been career-changers. The fifth factor, districts/schools high need status, included five items about the district/school high need status. These indicated scholars' perceptions of the percentage of students receiving free or reduced lunch, the percentage of teachers lacking sufficient training in the academic area they do

most of their teaching in, and the percentage of teacher attrition over the last three years. Higher scores corresponded to districts/schools meeting more Title II requirements for being considered high need.

The sixth factor, personal beliefs towards teaching, included nine items to which the scholars responded. Higher scores corresponded to higher levels of job satisfaction, opportunities for professional growth, and higher self-efficacy towards teaching. The seventh factor, school teaching environment, included five items regarding collaboration, support, and the availability of materials at their schools. Higher scores on this factor indicated that the scholars perceived their environment as being more collaborative and supportive. Finally, for the eighth factor, mentoring experiences, the scholars were asked six questions regarding mentoring experiences they might have received during and after their teacher certification program. Higher scores for this final factor indicated that the scholars reported more mentoring experiences.

School district interviews. Interviews were conducted with representatives from school districts that partnered with Noyce teacher certification programs. There were 19 district interviews conducted from January to July 2008 and these interviewees represented 19 districts. The 19 interviewees held a variety of positions in the districts in which they were employed. Nine (47%) held positions in administration, such as principal, superintendent, human resource director, and assistant superintendent of teaching and learning. Eight (42%) were employed as science or mathematics specialists, such as instructional coaches or content/curriculum supervisors. The remaining two (11%) were high school science classroom teachers who were not mentors but district representatives for the Noyce program. The length of time involved with the Noyce program or scholars varied from one through six years. The interview protocol included questions regarding general background information, district representatives' perceptions of Noyce scholars, hiring of Noyce scholars, mentoring practices within districts and schools, knowledge of the Noyce program, and how the Noyce program has affected districts and districts' relationships with the teacher certification institutions.

Classification of Alternative and Traditional Programs

The Noyce program is situated nation-wide and partners with various institutions; therefore, its scholars come from a number of alternative and traditional programs. Scholars were classified as belonging to either an alternative or a traditional program based on the time they became the official teacher of record in the classroom. Scholars who became the teacher of record at the beginning, after a brief introduction to the program, or during the first half of the program, were classified as attending alternative programs, whereas those who became the teacher of record during the second half or upon completion of their program were classified as attending traditional programs. With this classification scheme, 103 scholars were categorized as attending alternative programs and 331 were categorized as attending traditional programs. The 103 scholars were from 30 different alternative programs, and the 331 scholars were from 47 different traditional programs.

Analyses

All analyses included a quantitative or qualitative comparison of scholars enrolled in alternative and traditional programs. Pearson's Chi-square tests of independence were used for categorical data and independent *t*-tests were conducted for continuous data to compare the scholars on demographics, affective/personal characteristics, background experiences, level of commitment to becoming teachers, level of commitment to teaching in a high need school, beliefs about teaching, and their perceptions regarding the effectiveness of their certification programs. Select variables from the ORC database provided the demographic information, select items from the scholar survey measured their affective/personal characteristics and levels of commitment, and finally, the factor scores (for factors c through h) provided measurements on their background experiences, beliefs about teaching, and perceptions of their certification programs. It should be noted that the results for factors a and b were not reported because these factors were analogous to the survey items that measured the scholars' levels of commitment. Due to the exploratory nature of this research, a Bonferroni adjustment was not made on the family-wise error rate; thus, the alpha level of significance for all tests remained at $p = .05$.

To analyze the qualitative interview data, coding completed using grounded theory in the larger evaluation of the Noyce program were used to identify trends between the two groups. The codes represented various findings, including district perceptions of the affective characteristics of Noyce scholars. These perceptions were compared for similarities and differences between the two groups.

Results

Demographics

The Noyce scholars held various STEM content area majors. Overall, 39% of the Noyce scholars were mathematics majors, 52% were science majors, 5% were both science and mathematics majors, and 4% were engineering or technology majors. The alternative and traditional programs were compared on four scholar demographics; sex, percent of minorities, age, and race/ethnicity (Table 1). Overall, the Noyce scholars were 65% female and 35% male. Further, there were 68% white and 32% non-white participants. Chi-square tests revealed there was no difference in the distribution of percents between type of program and sex ($\chi^2(1, N = 434) = 0.048, p = .827, \phi = -.011$) or race ($\chi^2(1, N = 434) = 0.375, p = .540, \phi = .030$). However, a student's independent group comparison *t*-test revealed that scholars in alternative programs were significantly older ($M = 32.5$ yrs) than those in traditional programs ($M = 29.9$ yrs), $t(148.5) = 2.44, p = .016, d = .302$.

Table 1

Age/Sex/Race/Ethnicity of the Noyce Scholars		
	Alternative	Traditional
Age*	32.5yrs	29.9yrs
Female Male Ratio	64:36	65:35
Race		
Whites	68%	66%
Blacks	12%	11%
Asians	8%	10%
American Indians	0%	1%
Native Hawaiians	0%	1%
Missing	13%	12%
Responses		
Ethnicity		
Hispanic	8%	9%
Non-Hispanic	69%	63%
Not reported	23%	27%
Total	103	331

Note. $N= 434$. Numbers may not sum to 100% due to rounding. Statistical analyses of the different groups were not appropriate due to small sample sizes in some of the groups. * $p < .05$.

Affective/Personal Characteristics

On the survey, the scholars were asked to indicate which affective/personal characteristics influenced them to become teachers. They were given a list of seven choices and asked to check all that applied. Figure 1 demonstrates that the four most commonly selected choices were that they liked working with young people, they felt as if teaching allowed them to “make a difference” in the world, they liked sharing their subject with others, and that they felt they had a talent for teaching STEM. Scholars enrolled in alternative and traditional programs displayed similar patterns and there were no statistical differences on any of these, suggesting that they shared similar affective/personal characteristics that motivated them to become teachers.

Interview data from district representatives were also analyzed for perceived affective characteristics of the Noyce scholars. Interviews were conducted with district representatives who partnered with either alternative programs or traditional programs. Counts of the codes were carried out to determine the degree to which they were more or less representative of alternative and traditional programs. If certain perceptions were cited at a fairly equal rate, it was interpreted as a similarity between scholars enrolled in alternative and traditional programs. Conversely, if certain perceptions were cited at a

more disparate rate, then it was interpreted as a difference between the scholars. The interview data revealed that many of the district representatives' perceptions of Noyce scholars from alternative and traditional programs were similar. Comments pertaining to scholars from both types of programs were that they demonstrated maturity, were strong in their content knowledge, demonstrated leadership skills, and that they had a focused preparation in education. For example, interviewees were asked whether or not the typical Noyce scholar was more or less attractive as a hire compared to any other new teacher. A district representative who partnered with an alternative program said:

The candidates like the one we're seeing this year, the one working with us, I have no questions about her content, it's excellent. And we're already thinking about offering her a position for next year. The other thing is that she's a proven commodity. She's been working with our kids and we know that she can do it.

Similarly, a district representative who partnered with a traditional program said:

For sure more attractive. Because they've, they typically have a very strong math/science background. So they're typically more attractive in terms of their knowledge of math and science and their understanding of how you can apply it in the real world.

**Did any of the following help you decide to become a STEM teacher?
(Mark all that apply)**

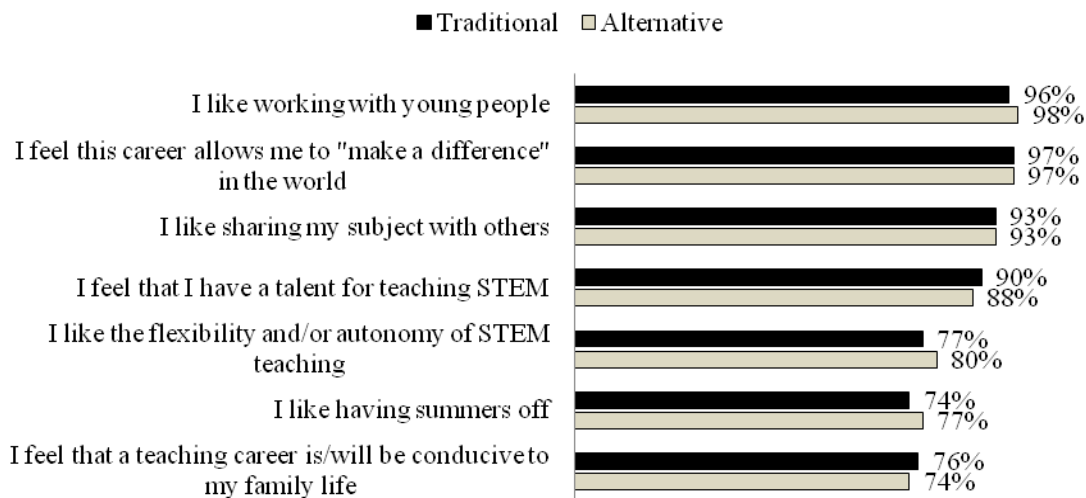


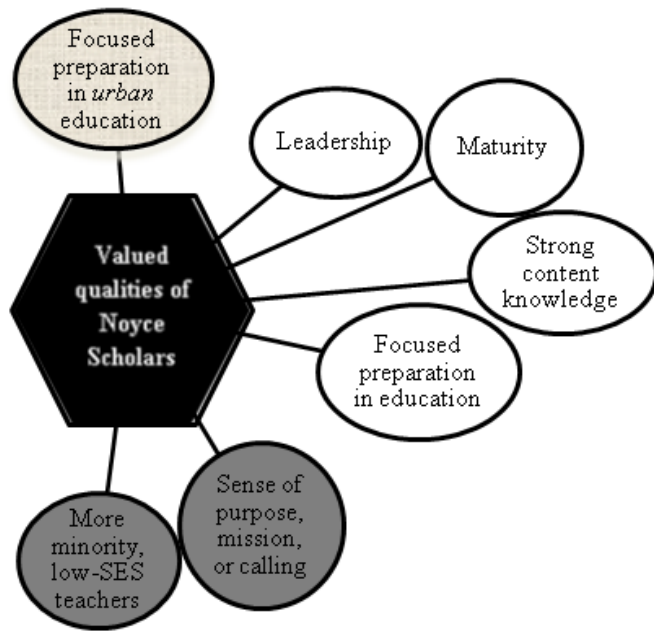
Figure 1. Affective/Personal characteristics of Noyce scholars, Alternative and Traditional

Along with the similarities, the interview data also revealed three differences. Representatives who partnered with alternative programs more often stated that they were receiving more minority and low-SES teaching candidates. For example, one

representative said “Minority students that otherwise would not be able to afford the cost of the education are involved.” Secondly, representatives partnering with alternative programs more often stated that their teaching candidates had more of a sense of purpose/mission/calling. The third difference was that representatives who partnered with traditional programs more often suggested that their teaching candidates had teacher preparation more focused on urban education. For example, one representative said:

Well, when they sign the contract, they come in mentally prepared and content prepared to work with children in high needs areas. So all the time that they are working on their certification they know what the end result will be. Working in a district with high needs students.

A summary of the similarities and differences is presented in Figure 2. It should be noted, however, that the district interviews represented only 12 teacher certification programs (five alternative, seven traditional) therefore any perceived qualitative differences between scholars enrolled in alternative and traditional programs may be due to the strength of individual programs rather than alternative or traditional program structure.



KEY:

Light grey circle – More often said by district representatives who partnered with traditional programs

Dark grey circles- More often said by district representatives who partnered with alternative programs

White circles- Things said by district representatives that were common to both alternative and traditional programs

Figure 2. Similarities and differences in district representatives’ perceptions of Noyce scholars from alternative and traditional programs.

Commitment to Becoming Teachers and Teaching in a High Need School

On the survey instrument, there were two categorical items that served as proxies for measuring scholars’ commitment to becoming teachers and their commitment to teaching in a high need school, respectively. For these items, the scholars were asked to indicate “no”, “possibly”, or “yes” as to if they would have become teachers without the Noyce funding, and also if they would have taught in a high need school without the Noyce funding. If scholars indicated “yes”, they would have become teachers even without the Noyce funding, this was interpreted as scholars having a higher commitment to becoming teachers. Conversely, if the scholars indicated “no” or “possibly”, then this was interpreted as scholars possibly having a lower commitment to becoming teachers. The same interpretation held for the item measuring scholars’ commitment to teaching in a high need school. Figures 3 and 4 display the responses of the scholars to these two items. Overall, a visual inspection of the percentages for “no”, “possibly”, “yes” in both figures suggests that in general, the Noyce funding may have been more influential on scholars decisions to teach in high need school rather than in their decisions to become teachers because in both groups the majority of the scholars indicated “yes” they would have become teachers regardless of the Noyce funding. In contrast, less than 50% of them indicated they would have taught in a high need schools regardless of the Noyce funding. Scholars in traditional programs had more of a tendency to indicate they would have become teachers regardless of the Noyce funding (79% compared to 74%), whereas alternative scholars had more of a tendency to indicate they would have taught in a high need school even without the Noyce funding (41% compared to 36%), although chi-

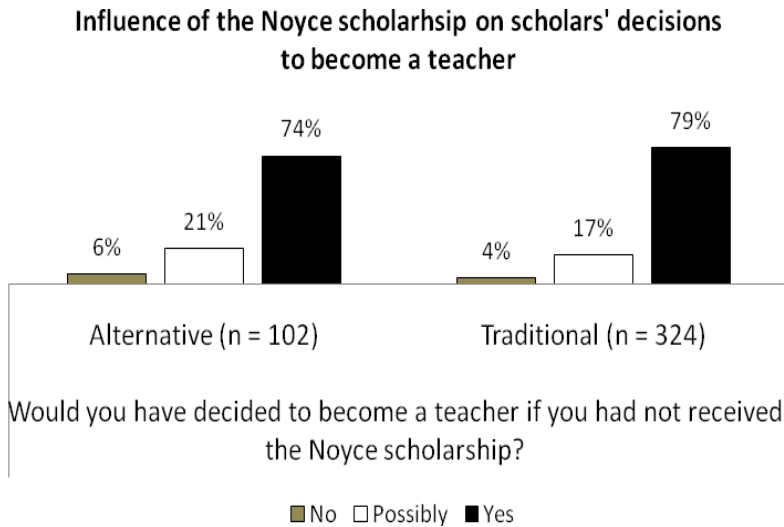


Figure 3. Comparison of scholars in alternative and traditional programs on their commitment to become teachers

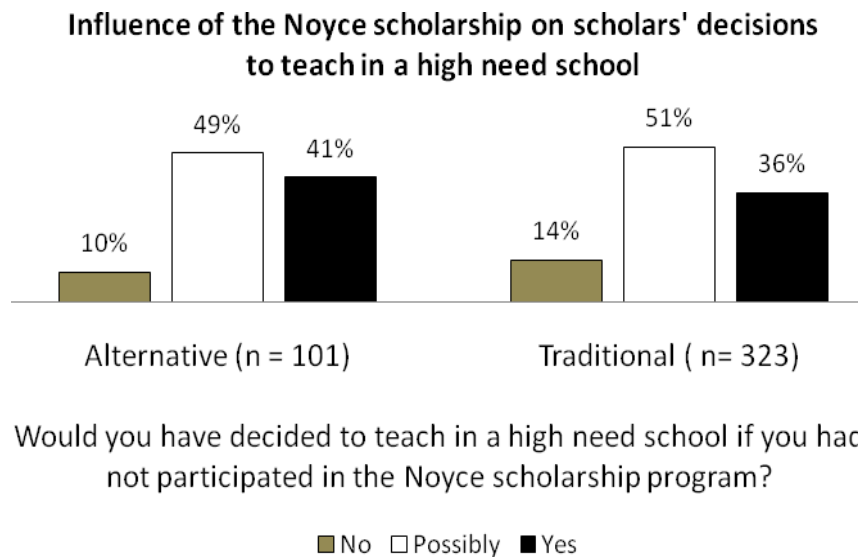


Figure 4. Comparison of scholars in alternative and traditional programs on their commitment to teach in high need schools

square analyses revealed that there was no difference in the distribution of percents between type of program and decision to teach in a high need school: $\chi^2(2, N = 426) = 1.34, p = .510$, Cramer's $V = .056$ and $\chi^2(2, N = 424) = 1.66, p = .436$, Cramer's $V = .063$ respectively.

Background Experiences and Beliefs/Perceptions about Teaching

The factor scores obtained from the factor analyses of the survey instrument described above were examined to determine similarities and differences between scholars enrolled in alternative and traditional programs regarding their background experiences, beliefs and perceptions of how their programs prepared them for teaching in high need schools. (Comparisons here are presented for factors c through h only, because the results for factors a and b are analogous to what was presented in Figures 3 and 4 above). Independent *t*-tests revealed that scholars enrolled in alternative programs were not significantly different from those in traditional programs in how prepared they felt about teaching in a high need school (factor c, $t(397) = 1.81, p = .072, d = .212$) nor their perceptions about their school teaching environments (factor 7, $t(288) = .045, p = .969, d = .005$). In contrast, scholars in alternative programs scored significantly higher on the four remaining factors. These scholars were more likely to have taken higher level courses and consider themselves to be career changers (factor 4, $t(220) = 3.27, p = .001, d = .501$), had a higher tendency to work in districts/schools that were classified as high need (factor 5, $t(272) = 3.02, p = .002, d = .394$), reported more job satisfaction (factor 6, $t(260) = 2.372, p = .018, d = .317$), and reported more mentoring experiences (factor 8, $t(399) = 5.17, p < .001, d = .459$) as compared to scholars in traditional

programs. Hence, overall, scholars enrolled in alternative and traditional programs were significantly different on four of the six factors.

Table 2

Factor Scores

Factor	Factor scores	
	Alternative (M, SD) n =	Traditional (M, SD) n =
3.Preparation for high need school	(.173,.868) n = 95	(-.022,.934) n = 304
4.Path to teaching **	(.274,.917) n = 54	(-.182,.882) n = 168
5.District/school high need environment **	(.230,.752) n = 81	(-.107,.882) n = 193
6. Personal beliefs towards teaching *	(.162,.750) n = 79	(-.096,.830) n = 183
7. School teaching environment	(-.002,.884) n = 90	(-.007,.892) n = 200
8. Mentoring Experience ***	(.423,.816) n = 92	(-.089,.840) n = 309

Note. * indicates $p < .05$, ** $p < .01$, *** $p < .001$ between scholars enrolled in alternative and traditional programs.

Discussion

This study compared Noyce scholars enrolled in alternative and traditional teacher certification programs on their demographics, personal/affective characteristics, commitment to teaching, background experiences, personal beliefs about teaching, and personal perceptions of their programs’ effectiveness in preparing them for teaching in high need schools. Results from this study indicated that Noyce scholars from alternative and traditional teacher certification programs were similar in demographics, except for age. This age difference is consistent with common knowledge about teacher candidates enrolled in alternative and traditional certification programs. The finding that both alternative and traditional programs had high representations of ethnic minority groups is in contrast to the literature which purports that alternative programs typically attract more minority teacher candidates (Shen, 1998). Perhaps this is a result of the Noyce program’s emphasis on recruiting scholars from underrepresented groups. The Noyce program in general has more participants from ethnic minority groups (32%) compared to the national average of STEM teachers (9-14% depending on subject and

grade range (Weiss, Banilower, & Smith, 2001)). The district representatives that partnered with Noyce alternative programs more often stated that they were getting more minority candidates, which contradicts our demographic comparisons. It therefore appears that incentives such as the Noyce funding may help traditional programs attract a more diverse pool of teaching candidates, which has typically been a strength of alternative programs. Teacher ethnic diversity is important because urban high need schools typically have higher percentages of students of color, and minority teachers are perceived as being better equipped to assist minority students in the transition from school to society, especially if these teachers grew up in urban environments (Salinas, 2002). Furthermore, according to Clewell and Villegas (2001), if selected carefully and given appropriate preparation, teacher candidates from racial/ethnic minority groups who are enrolled in teacher certification programs that work in partnerships with high need school districts are likely to choose high need settings and stay in their positions longer than the average new teacher.

The non-significant results for factor c, preparation for high need schools, suggest that scholars enrolled in alternative and traditional programs were similar in their perceptions of the effectiveness of their programs in preparing them for high need schools. These results corroborate the finding of Finn (2003) who reported that alternative routes often produce teacher candidates who are just as capable inside the classroom as compared to those who went through more “professional” or traditional programs. Thus, these findings regarding scholars’ perceptions of their programs lend support to the advocates of alternative programs who contend that alternative routes of certification might be more cost efficient in supplying the demand of quality STEM teachers into high need schools.

Two significant differences found between scholars in alternative and traditional programs on the factors were due to their background experiences and beliefs about teaching. The finding that scholars from alternative programs had taken more advanced courses in their content area (factor d) is consistent with the literature that reports that most alternative programs require a bachelor’s degree in some content area (Qu & Becker, 2003). Furthermore, the finding that scholars in alternative programs have a higher tendency to perceive themselves as career changers (factor d) is also consistent with Legler (2002). In contrast, the finding that scholars attending alternative programs may have had higher self-efficacy towards teaching (factor 6) is inconsistent with the work of Darling-Hammond and Sykes (2003) and Guyton et al. (1991) who found, instead, that traditional scholars tended to report higher perceptions of preparedness for the classroom.

The finding that scholars enrolled in alternative programs reported more mentoring experiences is consistent with Legler (2002) who reports that most alternative programs tend to have more intensive mentoring support than traditional programs. Mentoring experiences may be an important factor in teacher certification because teacher education literature is replete regarding its benefits. Onchwari (2008) provides a summary of these benefits and highlights the fact that mentoring allows the novice teacher to talk about their practice, observe others’ practice, and work together to plan,

design, research, and evaluate curriculum. Furthermore, mentoring also allows the novice teacher to feel safe making mistakes and practice becoming more reflective. An example of an alternative route that has adopted intensive mentoring is the burgeoning Urban Teacher Residencies (UTR) program of Chicago and Boston (Berry et al., 2008). These researchers found that the implementation of an intensive mentoring program, along with other important program features, resulted in a principal stating that teacher candidates who completed the UTR program took more advantage of mentoring opportunities available at their appointment site. The principal also reported that these candidates were more apt to ask for and receive constructive feedback from their colleagues as compared to other beginning teachers. Furthermore, this study showed that the UTR teachers had a higher retention rate inside high need schools as compared to teachers trained by other routes. Zeintek (2006) also found that positive mentoring experiences influenced novice teachers' perceptions and sense of preparedness for the classroom.

Research supports the notion that teacher intrapersonal characteristics play an important role in their resiliency in high need settings. Erskine-Cullen and Sinclair (1996), Haberman (1995), and McKinney et al. (2007) have all identified affective characteristics of teachers best suited for high need settings. There were no significant differences between the two groups of scholars in their level of commitment to becoming teachers or their level of commitment to teaching in a high need school, which are important characteristics of successful teachers in high need schools (Haberman, 1995). Noyce scholars enrolled in alternative programs, nevertheless, were more likely to report working in high need schools (factor e) compared to those enrolled in traditional programs. This is consistent with Shen (1997a) who compared alternative and traditionally prepared teachers. However, our survey findings did not allow us to suggest demographic or personal/affective differences that may contribute to them working in high need settings because there were no significant differences between the scholars regarding demographic or personal/affective characteristics on the survey. Still, district representatives who partnered with alternative programs more frequently cited that they perceived their scholars as having a higher sense of purpose/mission/calling compared to other teacher candidates. This contradicts our survey findings of no differences in affective characteristics between scholars in alternative and traditional programs and suggests that a limitation of this study was that the survey instrument was not sensitive enough to more specific intrapersonal characteristics. It should be noted though that the district interviews represented only 12 programs, therefore strengths or weaknesses of individual programs may mask or exaggerate any larger trends regarding alternative or traditional programs structure. The notion that scholars from alternative programs may have a higher sense of purpose/mission/calling may be due to the fact that alternative programs often attract career changers. Career changers generally have made more of a sacrifice to become a teacher and that may be interpreted as an increased sense of purpose/mission/calling.

The results for factor 5 suggest that alternative programs may either attract candidates who are better equipped for teaching in high need schools, or that alternative programs might provide better preparatory courses for working in high need schools.

The results of our study, however, do not bring clarification to this speculation. Hence, it is important to determine why these scholars enrolled in alternative programs were more likely to teach in high need schools. If it is due to intrapersonal characteristics (as might have been suggested by the district interview data), then recruiting efforts ought to be tailored towards individuals of a particular disposition. This might help ensure that funding incentives designed to support teacher candidates and potentially lure them into high need settings will not be a wasted investment due to these teachers leaving high need settings. Teacher attrition is of particular concern to high need schools since it tends to occur at a higher rate in these settings (Hanushek, Kain, & Rivkin, 2001; Kirby, Berends, & Naftel, 1999; Plecki, Elfers, Loeb, Zahir, & Knapp, 2005; Shen, 1997b). However, if the difference in the number of scholars teaching in high need schools is due to program characteristics, traditional programs might be well served to incorporate some of the characteristics of alternative programs, such as intensive mentoring. In addition, our findings from district interviews suggest that traditional programs that incorporate a strong urban emphasis are highly valued by school districts.

In summary, our findings demonstrate that Noyce scholars from alternative and traditional programs were similar in most demographics, in their affective characteristics, in their levels of commitment to teaching, and in their perceptions regarding their programs. In contrast, they differed in background experiences, beliefs about teaching, mentoring experiences, and teaching location. Moreover, the data suggest that alternative routes might attract more candidates who are more likely to teach in high need schools. Finally, mentoring opportunities and coursework and fieldwork that have a strong urban emphasis appear valuable for teacher candidates who intend to teach in high need settings; therefore, all teacher preparatory programs might want to consider incorporating both intensive mentoring and a strong urban emphasis to better prepare teacher candidates for working in high need schools.

Limitations

One limitation of this study is in the way traditional and alternative programs were defined. For this study, traditional programs were defined as those that completed at least half of their certification requirements before becoming the teacher of record. This was because the survey item asking “When did you become teacher of record?” had options limited to “at the beginning of the program”, “after a brief introduction (e.g. a summer session)”, “during the program first half”, “during the program second half”, and “upon completion of the program”. The fact that “upon completion of the program” may or may not include student teaching, and “during the program second half” can possibly include the completion of certification requirements with the exception of student teaching, leaves room for speculation. Since institutions like Missouri State University allows students in any teaching program to become the teacher of record before completing student teaching if they have completed all other certification requirements (see <http://www.missouristate.edu/certification/teachofrecord.htm>) lends credence to our classification scheme; however, this might not be the norm for most institutions.

A second limitation of the study is the fact that alternative programs allow their students to enter the field earlier than traditional programs; therefore, the presence of more alternatively prepared scholars in high need schools might be an artifact of this process. To test whether or not alternatively prepared scholars are actually in high need schools in higher percentages, it would be necessary to sample the two groups of scholars and record their presence in high need schools for a fixed amount of time after certification. A third limitation to the study is responder bias to the survey and interviews. It is possible that those who responded to the survey or interview request were not representative of the intended populations; therefore, inferences made are limited.

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Examining the Relationship between E-Coaching and the Self-Efficacy of Novice Teachers Seeking Certification through Alternative Routes

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***Abstract:** A study was conducted to examine the relationship between first-year teachers' self-efficacy and their participation in e-Coaching designed to positively influence development of mathematics content knowledge, development of pedagogical content knowledge, and teacher retention. Teachers who most frequently participated in e-Coaching, on average, reported lower levels of self-efficacy at the start of the school year and a greater annual gain in self-efficacy than teachers who participated in e-Coaching less frequently. Study findings suggest that with careful planning and collaboration, e-Coaching can be used as a virtual and distributed context for supporting beginning teachers' self-efficacy development.*

***Key Words:** alternative certification, e-Coaching, beginning teachers*

Alternative certification programs are increasingly preparing teachers in order to address staffing needs and effectively foster student learning and development (Chin & Young, 2007; Clewell & Vilegas, 1999; Feistritz, 2009; Gimbert, Cristol, & Sene, 2007; Guarnio, Santibanez, & Daley, 2006). Such work necessitates that teachers have content knowledge and can enact principles of teaching and learning within complex environments (Darling-Hammond & Bransford, 2005; Grant, 2005; National Commission on Teaching and America's Future,

1996). Given the expectation that “tomorrow’s teachers will need to be even more talented than today’s” (Goldhaber & Hannaway, 2009, p. 2), the work of preparing teachers is challenging for all teacher preparation programs, traditional and alternative alike. Despite shortened teacher training time periods and a diverse pool of candidates (Martin Haberman, 2006), alternative certification programs are expected to prepare teachers with dispositions, knowledge, and skills that mirror those of their traditionally trained counterparts.

Many teacher preparation programs are using e-learning and other information technology (IT) systems to deliver instruction, enhance course work, encourage reflection of course readings and field experiences, and manage student portfolios and accreditation documentation (Hirtle & Hadaway, 2003; Rock, Gregg, Gable, & Zigmond, 2009; Vavasseur & MacGregor, 2008; Zirkle, 2005). As the use of e-learning and other IT systems become more prevalent in teacher education, it is imperative that such tools are designed and employed to address teacher candidate, teacher educator, and programmatic needs. The carrying out of such work necessitates that teacher educators and information systems designers have an in depth understanding of how teacher education programs can be structured, the nature of teaching and learning, and how technology-rich learning environments can be designed to support teacher learning (Anthony, Gimbert, Kashou, & Parker, 2010). Furthermore, empirical research regarding the use of such systems will provide insights into contextual, systemic, and user factors that can inform subsequent development and use of teacher education, technology-rich learning environments. Assembling a comprehensive body of research on IT systems in teacher education becomes challenging given the diversity in teacher preparation programs as well as the ever-growing ways that IT systems can be customized and employed to support teacher learning. The challenge for researchers is to not only examine the effectiveness of IT systems on teacher candidates, but also to document how technology is being used in particular contexts. Given that the common usage of the term *alternative certification* has resulted in programs that differ in terms of requirements and structures (Feistritzer, 2009; Martin Haberman, 2006), context-specific research is needed that can help inform program leaders’ decisions as they consider if and how to use technology to support teacher training. This article presents findings from a pilot study conducted to examine the impact of participation in e-Coaching on the self-efficacy development of novice teachers who were trained by an alternative certification program.

Teacher Mentoring

Mentoring is a common element of alternative certification programs designed to provide guidance and support to teachers in their beginning teaching experiences. (Feistritzer, 2008; Gratch, 1998; Smith & Ingersoll, 2004). Mentoring is done for a number of reasons. Given the need for teachers learn to make teaching decisions within highly context-specific activities that are influenced by many variables such as school structure, school culture, subject matter, and student background (Darling-Hammond, 2001; Pugach & Raths, 1983), it is not surprising that the early experiences of non-traditional pre-service teachers have been described as isolating, challenging and overwhelming (Gratch, 1998). Teachers recognize the benefit of mentoring and support (National Retired Teacher's Association, 2003) to help teachers develop expected knowledge and dispositions during the shortened training component of their certification programs. For without adequate knowledge, novice teachers may focus on survival rather than providing students with optimal learning experiences (Chesley, Wood, & Zepeda, 1997). In

addition to addressing teachers' knowledge needs, research suggests that mentoring can be an effective strategy for positively influencing teachers' long-term experiences and perspectives (U.S. Department of Education, 2002) and retention in the teaching profession (Chin & Young, 2007; Feiman-Nemser, 1996; Smith & Ingersoll, 2004).

A variety of mentoring arrangements can be employed to provide support to novice teachers. Mentoring typically occurs through on-the-job training during the first year of teaching (Humphrey & Wechsler, 2007; Little, 1990). Arrangements may include mentoring from a team consisting of veteran teachers and support from fellow colleagues who are new teachers (National Retired Teacher's Association, 2003). Teachers may also be paired with a mentor in a specific subject area (National Retired Teacher's Association, 2003). Mentoring activities often include sharing of ideas between mentors and mentees, as well as opportunities for beginning teachers to engage in reflective practice (Bradbury & Koballa, 2007). Other activities may include demonstrations of lessons, mentor-mentee lesson planning, sharing of curricular resources, and discussion of novice teachers' strengths and needs (Humphrey, Wechsler, & Hough, 2005)

Despite the promise of providing mentoring to novice teachers, a number of concerns have been identified that could limit mentoring effectiveness, including organizational issues and quality of mentoring. In regards to organizational culture and politics, one concern is that mentors may promote conventional norms and practices, thus limiting beginning teachers' adoption of reform-oriented practices (Feiman-Nemser, Parker, & Kenneth, 1993). Additionally, mentees may find it difficult to share confidences with senior colleagues who are employed by the same district (Bloom, Castagna, & Warren, 2003). Just as alternative certification programs differ in terms of structure, mentoring arrangements may also differ across programs, resulting in varied experiences and quality (Darling-Hammond, 1990; Humphrey & Wechsler, 2007). This problem is further exacerbated when expectations for mentoring are placed on veteran teachers who already have heavy workloads (Steadman & Simmons, 2007). In one study, teachers who received less support from mentors reported more difficulty with classroom organization, working with at-risk students, and using varied instructional strategies (Chesley et al., 1997). Quality differences are also influenced by differences in content of mentoring. One study found that guidance and support from mentors centered on general pedagogical knowledge such as the management of the classroom environment and pacing of lessons as opposed to content specific knowledge (Bradbury & Koballa, 2007).

Research has documented that despite mentoring opportunities, teachers from alternative certification programs have reported feeling unprepared for the realities and complexities of teaching. In particular, they have indicated a need for additional help with classroom management and motivating students, making effective use of limited instructional planning time, and learning to work with minority study populations (Chesley et al., 1997). In an effort to address mentoring gaps, it has been suggested that programs have clear goals, improve communication with mentors and candidates, ensure that mentoring includes a strong instructional focus (Utsumi & Kizu, 2006), and provide support with working with students from urban communities (King & Bey, 1995).

Teacher Coaching

Coaching is one strategy for supplementing and addressing gaps in teacher mentoring. Coaching is a professional learning strategy that addresses learning and professional needs of working individuals. The focus is on goal achievement and improving individual performance. Such professional learning experiences tend to be on-going instead of occurring during discrete workshops, embedded in authentic practice, and guided by professionals and peers who can support novice teachers as they engage in lesson planning and teaching activities. While mentors are typically senior organizational insiders in job positions similar to mentees, coaches tend to be carefully-selected organizational outsiders who can provide support to working individuals while minimizing concerns about privacy and organizational politics (Bloom et al., 2003). Coaching may be provided by an external coach or a consultant who can provide expert support around wide-ranging issues with an intent of helping an individual meet their personal goals for improving professional performance (Bloom et al., 2003; Thompson, Vickers, London, & Morrison, 2008)

Several studies have documented the benefit of coupling mentoring and coaching to increase support for alternatively certified teachers who teach in hard-to-staff schools. In a study situated in Milwaukee Public Schools, Haberman (1999) found that coupling mentoring and coaching was effective with preparing alternatively certified teachers, maintaining higher retention rates, and teachers positive appraisals by principals. Another study on the Northwest Indiana Urban Teacher Preparation Program, which provided teachers with mentoring and coaching, yielded feedback from students, their mentors, principals, and university faculty, that suggested that the program successfully prepared teachers to teach in urban districts (Schoon & Sandoval, 2000). One caution, however, of coupling mentoring and coaching is that program leaders need to ensure that such support is complementary instead contradictory, resulting in additional confusion for candidates or practicing teachers (Humphrey & Wechsler, 2007). Given that mentoring and coaching are two different activities, teacher preparation programs are increasingly turning towards e-learning solutions as a means to accomplish both tasks in attempts to adequately prepare teachers. The next section reviews literature on e-learning in teacher preparation.

Blended Learning in Teacher Education

Blended learning, which is a combination of face-to-face instruction and e-learning, is increasingly being used in teacher education for teacher training, induction programs for beginning teachers, and professional development (Barab, MaKinster, & Scheckler, 2004; Dukes & Jones, 2007; Whitehouse, Breit, McCloskey, Ketelhut, & Dede, 2006). Blended learning can be implemented through a range of structures, such as e-learning being supplemental to traditional face-to-face instruction, e-learning replacing face-to-face activities, or as an emporium that offers instructional resources and learning opportunities that are available to learners on demand (Stacey & Gerbic, 2009). Extant research suggests that a blended learning environment can be just as effective as a traditional training program in preparing teachers to pass state licensure exams (Gimbert, Moore, & Sahin, 2010), that online professional development can have a positive impact on teacher knowledge (O'Dwyer et al., 2010), and that online courses can promote contextual learning opportunities for teachers (Mackey, 2009).

E-Coaching is one form of blended learning that has been used to promote the professional learning (Webster-Wright, 2009) of practicing teachers (Rock, Gregg, Gable et al., 2009; Vavasseur & MacGregor, 2008). Such coaching is often job-embedded, and can be delivered using telecommunication technologies and devices such as telephones, online discussion boards, instant messaging, video conferencing, and Bluetooth devices (Costello-Dougherty, 2008; Rock, Gregg, Howard et al., 2009; Rossett & Marino, 2005). E-coaching benefits include the ability to address constraints related to location, scheduling, and costs. Additionally, coaching sessions can be easily stored and retrieved for later use and coaches can provide support and expertise to a greater number of individuals and organizations (Rossett & Marino, 2005).

One study on the benefits of e-coaching found that through its use, teachers gained deeper content knowledge, enacted research-based instructional practices, viewed technology as powerful in supporting teaching and learning processes, and were successful in improving student engagement and enthusiasm (Rock, Gregg, Gable et al., 2009). Yet, as advances in technology expand end-users' ability for customization, and as technology is increasingly used as a distributed environment for supporting teacher development, there is a lack of research that examines the effectiveness of blended learning in preparing teachers to work in highly complex settings. In conducting this study, researchers examined whether teachers' participation in a blended learning environment supported their development of self-efficacy. The next section elaborates on why self-efficacy was designated as an outcome variable and summarizes research on the efficacy of teachers trained through alternative routes.

Teacher Self-Efficacy

Regardless of teachers' pathway for entering the teaching profession and the type of on-the-job support they receive, self-efficacy is a construct that if developed could increase teachers' capacity to teach in hard-to-staff schools. Self-efficacy is a teacher's belief in his or her capacity to organize and execute a course of action to successfully accomplish a teaching task, even in highly complex settings (Guskey, 1987; Knoblauch & Woolfolk Hoy, 2008; Rose & Medway, 1981). It has been described as the most powerful teacher attribute (Guskey, 1987) in light of its hypothesized and demonstrated influence on teaching practice and student achievement (Gibson & Dembo, 1984; Knoblauch & Woolfolk Hoy, 2008). Research also suggests that self-efficacy is related to teacher motivation to improve practice (Rose & Medway, 1981), teacher retention (Glickman & Tamashiro, 1982), and student efficacy (Knoblauch & Woolfolk Hoy, 2008). Given the complexities of teaching in hard-to-staff school districts, teachers are sure to face challenges. It is important that teachers sustain their efforts to provide rich learning experiences for students in the face of adversity.

Self-efficacy can be developed through exposure to mastery learning experiences in which learners receive explicit instruction on how to perform a task, observe modeled performance, and receive feedback on practice (Bandura, 1977). Teacher self-efficacy can be developed through gaining content knowledge (Swackhamer, Koellner, Basile, & Kimbrough, 2009), observing behaviors of highly efficacious teachers (Gibson & Dembo, 1984), receiving social support (Woolfolk Hoy, Hoy, & Davis, 2009), and encouragement to attribute instructional success to teacher efforts (Pintrich & Schunk, 1996). Additionally, a host of

contextual factors have been linked to teachers' development of self-efficacy, including school setting, urban, rural and suburban context, school collective efficacy, efficacy of the cooperating teacher (Knoblauch & Woolfolk Hoy, 2008), and student ability (Guskey, 1987).

Because existing research suggests that teacher preparation programs (Darling-Hammond, Chung, & Frelow, 2002) and school settings (Glickman & Tamashiro, 1982) can influence teacher self-efficacy, it is reasonable to assume that alternative certification programs that couple mentoring and coaching might successfully support teachers with facing the realities and complexity of teaching and developing self-efficacy. Given differences in the length and types of pre-service teaching experiences teachers trained through alternative and traditional routes receive, a number of studies have sought to investigate whether differences in teacher self-efficacy or perception of preparedness for teaching exist due to preparation pathway. Research results are inconclusive, with a number of studies suggesting that teachers trained through traditional routes have greater self-efficacy (Darling-Hammond et al., 2002; Flores, Desjean-Perrotta, & Steinmetz, 2004; Isaacs et al., 2007) and some finding no difference in self-efficacy between teachers trained through traditional and alternative routes (Tournaki, Lyublinskaya, & Carolan, 2009). Several studies have identified nuanced differences in teacher efficacy depending on preparation route taken. For example, one study found differences in personal efficacy between traditionally and alternatively certified teachers, but no difference in teaching efficacy (Flores et al., 2004). Another study compared teachers' sense of self-efficacy and found no significant difference between teachers who received a master's degree with certification and teachers trained through alternative routes. Yet teachers in the undergraduate program had higher levels of efficacy. (Forsbach-Rothman, Margolin, & Bloom, 2007).

Although a number of studies have compared self-efficacy of teachers trained through traditional undergraduate, master's, and alternative routes, there is a lack of research that examines within-group differences in self-efficacy among alternatively certified teachers. This pilot study on whether e-Coaching was effective in supporting teachers seeking certification through alternative routes was conducted to contribute to this knowledge gap.

Program Description

Project KNOTtT (Kansas, Nevada, Ohio, and Texas Transition to Teaching) is a multi-state, multi-agency collaboration funded in 2007 by a five-year Transition to Teaching grant through the U.S. Department of Education's Office of Innovation and Improvement. KNOTtT partners work independently and collectively to recruit, prepare, support, and retain teachers of record in high need, hard to staff school districts. Project KNOTtT aims to support the ongoing work of alternative certification programs as well as novice teachers who enter the teaching profession through alternative routes. Through its partnerships, Project KNOTtT is a constellation comprising multiple professional communities of practice (Wenger, 1998). Teachers who participate in Project KNOTtT have opportunities to learn across a number of contexts: (1) the alternative certification programs in which they enroll, (2) the schools in which they teach, and (3) participation in the project's online learning environment that houses self-paced modules and e-Coaching with subject matter experts across content areas.

Drawing on Wenger’s communities of practice model, and in line with Cobb, McClain, Lamberg, and Dean’s (2003) conceptualization of schools as lived organizations that are configurations of communities of practice, relationships between communities involved in Project KNOTtT include the interconnections of boundary encounters, brokers, and boundary objects. Boundary encounters are when members of one community engage in activities with members of another community. Brokers are individuals who are members of two or more communities. As Cobb and colleagues state, the role of brokers “can be important in developing alignment between enterprises of different communities of practice” (p. 19). Boundary objects are experiences that have been reified into mutually beneficial artifacts that participating communities can utilize as they continue to construct experiences and meanings through use across communities.

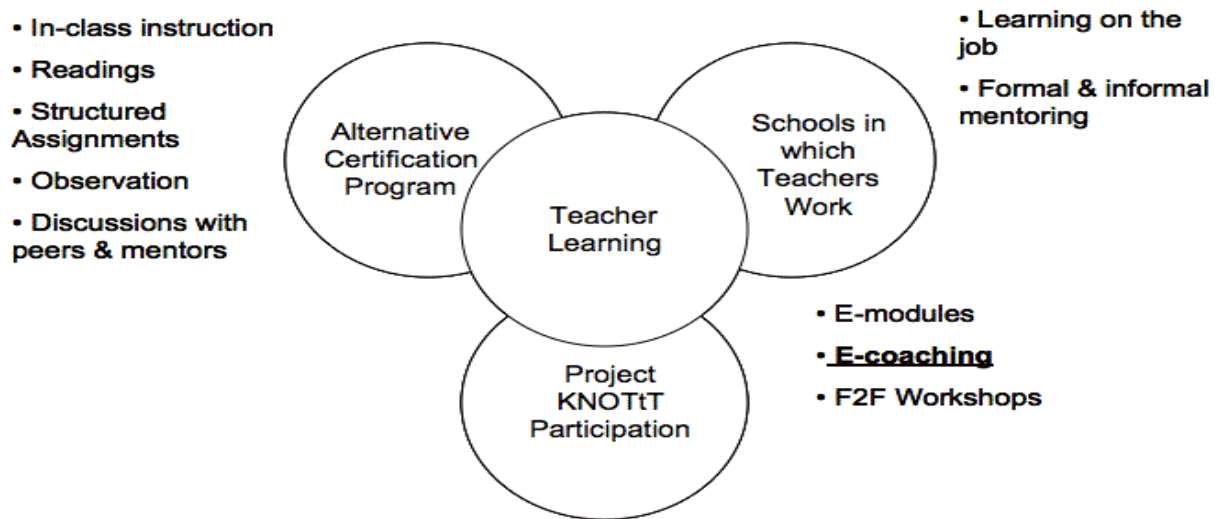


Figure 1. Shared work between Project KNOTtT, alternative certification programs, and schools to support novice teachers.

Teacher interns who receive Project KNOTtT services benefit from the boundary encounters that brokers participate in. Through KNOTtT boundary encounters, brokers become community members of KNOTtT as well as their employing organizations (i.e., school districts, alternative certification programs, universities). Spaces for boundary encounters include annual strategic planning meetings where representatives from member organizations and agencies meet to determine KNOTtT structures and services that will be provided to support alternative certification programs and teacher interns. Other boundary encounters include e-Coaching sessions and e-Coaching planning meetings. During the planning meetings, e-Coaches, alternative certification program coordinators, and the KNOTtT e-Coaching project manager meet to discuss teachers’ learning needs and determine the focus of upcoming e-Coaching sessions. Alternative certification program coordinators who attend the planning meetings engage in ongoing interaction with teachers and their mentors and are aware of the school

settings teachers work in and particular challenges they face on the job, of which e-Coaching could help address.

One of several mechanisms Project KNOTtT uses to support partners' teacher preparation efforts is the KNOTtT blended learning environment, which combines elements of traditional face-to-face instruction and online instruction across a variety of contexts. These contexts include face-to-face training sessions conducted during on-site visits with partnering preparation programs, face-to-face national meetings that provide a venue for KNOTtT partners to collaboratively plan and improve program quality, and the KNOTtT website. The Project KNOTtT website is a boundary object that supports teacher preparation efforts in unique ways across programs. The KNOTtT website design was informed by adult and continuing education (Aragon, 2003; Knowles, Holton, & Swanson, 1998; Pappas & Jerman, 2004; Wolf, 2006), and instructional design that supports adult learners. (Berge, 1995; Bonk & Graham, 2006).

During Year 1 of Project KNOTtT, members of the strategic planning team worked with instructional designers to develop e-Modules, which are programmed instruction training modules that teacher interns can complete in preparation for their licensure exams. Another feature of the KNOTtT website is e-Coaching, which is a bi-weekly virtual meeting and mechanism for program capacity-building, teacher exam preparation, and teacher learning of professional skills and strategies for teaching in chronically low-performing, hard to staff, and high-poverty schools. This reification of e-Coaching as a boundary object continues during each planning session, as the interactions and interpreted needs of practicing teachers who are preparing for licensure exams are reified in each e-coaching session.

The e-Coaching boundary object becomes a space for participation within and between communities. Such participation varies across programs. Much of this is due to not only cultural differences across alternative certification programs, but also differences in program structures. Given that programs participating in the KNOTtT partnerships are in different states, they have different state requirements for recruitment, selection, and preparation. For example, Ohio has one alternative certification program in which teachers can take courses from any higher education institution that offers courses that meet state requirements. In Nevada and Kansas, teachers must pass exams prior to enrolling in their preparation program. Yet, in Texas, teachers can become teachers of record upon completion of 6-week summer training. After summer training, and while working as novices, teachers are allotted two years to pass their licensure exams. Thus, in Texas, teacher interns often begin using KNOTtT e-Modules during their 6-week summer training and utilize e-Coaching during their early teaching experiences to support their ongoing development of content and practice knowledge.

Examining the Relationship between e-Coaching Attendance and Teacher Self-Efficacy

A study was conducted over a one-year period to investigate whether teachers' participation in the KNOTtT blended learning environment had a positive impact on their sense of self-efficacy. We first investigated whether the teachers who attended e-Coaching experienced higher gains in self-efficacy than teachers who did not attend e-Coaching. We then further investigated whether the amount of e-Coaching sessions attended corresponded with gains teacher self-efficacy.

Methods

In conducting this study, a decision was made to focus on one alternative program because of structure and process differences across programs. Additionally, by focusing on mathematics teachers in one program, researchers were able to control for some contextual influences on teacher self-efficacy. In September 2009 thirty-five mathematics teachers who had recently completed a 6-week summer training session in a Texas alternative certification program were recruited to participate in this study. Teacher interns who had not successfully passed their state mathematics licensure exam by January 2009 were required by the alternative teacher preparation program to attend e-Coaching sessions.

The 12-item version of the Teachers' Sense of Efficacy Scale was used to measure participants' sense of self-efficacy. Participants indicated their response to each statement on a 9-point Likert scale ($\alpha = .90$) that included the dimensions efficacy in student engagement (4 items, $\alpha = .81$), efficacy in instructional strategies (4 items, $\alpha = .86$), and efficacy in classroom management (4 items, $\alpha = .86$). Validity and reliability of the instrument have been well documented (Tschannen-Morgan & Hoy, 2001). The survey also included self-report items questioning teachers about their use of KNOTtT's blended learning environment. A pre-survey was administered in October 2009, and a post-survey was administered in June 2010. Of the 35 mathematics teachers, 20 completed both the pre- and post-survey. Due to sample size, the non-parametric 2-tailed Wilcoxon signed rank test was used to analyze paired data from each teacher to examine whether e-Coaching attendance resulted in significant gains in self-efficacy. In addition to the survey, observation data was recorded to track teachers' e-Coaching attendance between October 2009 and October 2010.

Findings

The average pre-survey efficacy score of the 35 teachers recruited to participate in this study was 7.06 (SD = 1.18). Interestingly, the average mean and standard deviation appeared to closely resemble the average efficacy scores of traditionally trained teachers whose responses informed the development of the Teacher Sense of Efficacy Scale (Mean = 7.1, SD = .98).

Of the 20 participants who completed the pre- and post-survey, teachers who were required to attend KNOTtT e-Coaching because they had not yet passed their licensure exam on average reported higher self-efficacy pre-survey scores than teachers who successfully pass their licensure exam and were not required to attend KNOTtT e-Coaching (**Table 1**) for self-efficacy overall (7.46 > 6.75) and in all dimensions of self-efficacy - student engagement (7.17 > 6.64), instructional strategies (7.38 > 7.36), and classroom management (7.81 > 6.25).

The teachers who attended KNOTtT e-Coaching also reported higher post-survey scores than teachers who did not attend KNOTtT for self-efficacy overall (7.77 > 6.89) and in all dimensions of self-efficacy - student engagement (7.50 > 6.50), instructional strategies (7.96 > 6.89), and classroom management (7.85 > 6.61). Interestingly, teachers who did not attend KNOTtT e-Coaching reported a decrease in student engagement efficacy (-0.14) and

instructional strategies efficacy (-0.47) over the course of the academic school year. Unlike teachers who did not attend KNOTtT e-Coaching, teachers who attended e-Coaching reported gains and no decrease over the school year in self-efficacy overall (0.31) and in all dimensions of self-efficacy - student engagement (0.33), instructional strategies (0.58), and classroom management (0.04). However, none of the gains or decreases in self-efficacy scores were statistically significant.

Table 1. Teacher self-efficacy scores at beginning and end of school year based on whether teachers attended e-Coaching

	Mean (SD)		Gain	P Value
	AU09	SP10		
Passed exam & did not attend e-Coaching (n=7)				
Overall Efficacy	6.75 (1.06)	6.89 (.78)	0.14	.60
Student Engagement Efficacy	6.64 (1.23)	6.50 (.85)	-0.14	.80
Instructional Strategies Efficacy	7.36 (1.13)	6.89 (2.07)	-0.47	.67
Classroom Management Efficacy	6.25 (1.49)	6.61 (1.38)	0.36	.35
Did not pass exam & attended e-Coaching (n=13)				
Overall Efficacy	7.46 (1.28)	7.77 (.62)	0.31	.36
Student Engagement Efficacy	7.17 (1.59)	7.50 (.88)	0.33	.56
Instructional Strategies Efficacy	7.38 (1.47)	7.96 (.67)	0.58	.23
Classroom Management Efficacy	7.81 (1.30)	7.85 (.72)	0.04	.79

* $p < 0.10$

Additional analysis was conducted on the teachers who did not pass their licensure exam and were required to attend e-Coaching in order to investigate whether the amount of e-Coaching sessions attended had an impact on self-efficacy. The results are displayed in **Table 2**. Teachers

Table 2. Teacher self-efficacy scores at beginning and end of school year by number of e-Coaching sessions attended

	Mean (SD)		Gain	P Value
	AU09	SP10		
Attended 5 or less e-Coaching sessions (n=7)				
Overall Efficacy	8.01 (1.04)	7.74 (.80)	-0.27	.18
Student Engagement Efficacy	7.68 (1.64)	7.32 (1.10)	-0.36	.35
Instructional Strategies Efficacy	8.07 (1.12)	7.96 (.73)	-0.11	.69
Classroom Management Efficacy	8.28 (.94)	7.93 (.75)	-0.35	.14
Attended 6 or more e-Coaching sessions (n=6)				
Overall Efficacy	6.81 (1.30)	7.81 (.40)	1.00	.075*
Student Engagement Efficacy	6.58 (1.42)	7.71 (.60)	1.13	.14
Instructional Strategies Efficacy	6.58 (1.51)	7.96 (.66)	1.38	.094*
Classroom Management Efficacy	7.25 (1.52)	7.75 (.74)	0.50	.46

* $p < 0.10$

who attended 5 or fewer e-Coaching sessions reported a decrease in self-efficacy overall (-0.27) and in all dimensions of self-efficacy - student engagement (-0.36), instructional strategies (-0.11), and classroom management (-0.35). However, the decrease in self-efficacy was not statistically significant. Teachers who attended 6 or more e-Coaching sessions reported gains in self-efficacy overall (1.00) and in all dimensions of self-efficacy - student engagement (1.13), instructional strategies (1.38), and classroom management (0.50). The gains were statistically significant for self-efficacy overall (Wilcoxon signed rank test, 2-tailed, $P = .075$) and instructional strategies efficacy (Wilcoxon signed rank test, 2-tailed, $P = .094$).

Conclusion

The current study presents findings about the impact of participation in Project KNOTtT's e-Coaching on teachers' self-efficacy. Beginning teachers who had not yet passed licensure exams, and who the literature suggests are most in need of on-the-job professional learning opportunities (Chesley et al., 1997; Humphrey & Wechsler, 2007; Schoon & Sandoval, 2000), reported higher levels of self-efficacy at the beginning and end of the school year than teachers who had successfully passed their content exams. These findings suggest that teachers trained through alternative routes may enter the teaching profession with a high degree of self-confidence to carry out teaching tasks. Teachers who enter the teacher profession through alternative routes may have higher levels of confidence because they are typically, although not always, older and have some degree of substantial work and life experience (Chesley et al., 1997; Chin & Young, 2007; Guarnio et al., 2006; Kennedy, 1991). It may then be that once teachers have passed licensure exams and attempted to reconcile differences between book knowledge and the demands of teaching in complex settings, that their levels of self-efficacy decrease and more closely resemble levels of their traditionally trained colleagues.

Further analysis of teachers who attended KNOTtT e-Coaching revealed that teachers who attended most frequently were those who began the school year with lower levels of efficacy than their colleagues. Additionally, teachers who attended KNOTtT most frequently reported statistically significant gains in self-efficacy overall and in instructional strategies efficacy. This suggests that the teachers who made the most use of e-Coaching were those who perceived that their teaching practice and students' learning would benefit from their attempts to gain more content and pedagogical content knowledge. Our findings are consistent with a recent study that found that teachers who tend to take advantage of professional learning opportunities are those who are personally motivated to improve their practice (Swackhamer et al., 2009). Our research extends these findings by demonstrating that teachers who participated in e-Coaching also experienced significant gains in overall efficacy and instructional strategies efficacy.

The previously summarized two key findings from this study differ from existing research on relationships between teacher efficacy and teacher qualifications and teaching experience. Previous research suggests that teachers with higher levels of efficacy are more likely to remain in the teaching profession (Glickman & Tamashiro, 1982). Inferring from the Glickman & Tamashiro study, the finding that teachers who had not yet passed licensure exams had higher levels of self-efficacy than teachers who did pass licensure exams would suggest that these less qualified teachers with high levels of self-efficacy might remain in the teaching

profession. Yet, recent research also suggests that teachers trained through alternative routes have a high likelihood of leaving the teaching profession within in five years (Darling-Hammond & Berry, 1999; Shen, 1997). Furthermore, previous research suggests that self-efficacy increases after teaching experience (Fortman & Pontius, 2000; Hoy & Woolfolk, 1990; Woolfolk Hoy & Burke Spero, 2005). However, in this study, teachers who had lower levels of participation in KNOTtT e-Coaching, on average, experienced declines in self-efficacy by the end of the school year. Inferring from these more recent studies would suggest that the relationship between efficacy and retention might differ for teachers depending on whether they trained through alternative or traditional routes. Given the link between teacher qualifications and efficacy that surfaced in this study, more research is needed that examines the relationship between efficacy and other outcomes for alternatively certified teachers.

Limitations

The findings and conclusions drawn from this pilot study have limitations, and the results should be considered suggestive rather than conclusive. Given the diversity across alternative certification programs, the numerous factors involved in teachers' development of self-efficacy, and the small sample size for this study, we are aware that our findings may not generalize to alternative certification preparation programs that are characteristically different from the Texas program that participated in Project KNOTtT's blended learning environment. Although this study suggests that e-learning (in this instance, e-Coaching) may be a new virtual and distributed context for supporting teacher self-efficacy, this study should be expanded to examine the effects of participation in e-Coaching on a larger number of teachers from a range of preparation programs.

Implications for Teacher Education

Study findings have implications for the design of blended learning environments for use in teacher preparation. Blended learning or e-learning is not a panacea for teacher education or professional learning (Njenga & Fourie, 2010). Instead, programs that intend to benefit from blended learning should provide organizational support to learners to ensure their participation and successful completion (Park & Choi, 2009; Southern Regional Education Board, 2006). Blended learning does not "replace" physical structures and process for teacher support. This works still requires careful planning, collaboration, and perhaps restructuring. Beyond programmatic attention to the design of blended learning environments, programs intending to make use of such environments should also consider whether learner characteristics influence their decisions to participate in and benefit from blended learning opportunities.

Partnerships can help distribute work and bring about systemic change. It has been suggested that school-university partnerships can lead to effectiveness in teacher preparation (Whitford & Metcalf-Turner, 1999). Partnerships can support exemplary practice across multiple institutions (Griffin & Associates, 2002) and can enable non-profit organizations and school districts to work together in the joint pursuit of effective and adaptive teacher preparation (Solomon, 2009). As discussed in this article, the KNOTtT partnership enabled multiple teacher preparation programs to access and utilize e-Coaching to supplement teacher training, exam preparation, and job-embedded professional development. Despite rapid technological advances

and the opportunities for end-users to customize systems to support the work of teacher training, programs should be mindful to consider the costs and benefits of investing in e-learning versus leveraging the power of partnerships and networks to support programs in their existing work. If partnerships are pursued to use technology in teacher preparation, then alternative certification programs should have a voice in design and implementation to ensure that e-learning solutions are employed in ways that align with program goals, structures, and processes.

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Reflections on the Quality Indicator Process

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***Abstract:** The purpose of this paper is to share a description of the process used by Fort Hays State University (FHSU) as a self-study of the FHSU alternative certification program, known as Transition to Teaching. Team members used the Quality Indicators designed as a part of a Department of Education Transition to Teaching Grant called the KNOTtT Project. KNOTtT is the acronym for Kansas, Nevada, Ohio, Texas Transition To Teaching.*

***Key Words:** Alternative Certification, quality indicators, program evaluation*

The FHSU Transition to Teaching program is an alternative pathway toward earning an initial Kansas State Department of Education teaching license. The program is part of the education unit at Fort Hays State University. As such, it follows the Professional Educator conceptual framework model subscribed to by the unit. The TTT program is designed to produce high-quality teachers who are capable of teaching to diverse groups of students using research-based methods and technologies. Additionally, this program, like all programs in the unit, is designed to produce a professional educator who is knowledgeable not only in content, but also proficient in the use of technology, relevant current pedagogy, and assessment procedures. Program completers, consistent with the University's mission, are liberally educated, self-aware, and self-motivated members of a learning community who meet the diverse needs of P-12 students in Kansas. All unit programs are approved through the Kansas State Department of Education and the National Council for Accreditation of Teacher Education (NCATE).

Alternative route candidates must work with FHSU and their local education agency to complete admission documentation. Program specialists analyze the transcripts of candidates interested in the program or who have been recommended for hire by one of the local education agencies. A previous content degree in the area in

which the candidate will be teaching, a cumulative grade point average of not less than 2.75 on a 4.0 scale, a signed contract with a district for the upcoming year, passage of the PRAXIS II content exam, and a practicum are all requirements of the program. Once approved, a Plan of Study is agreed upon and signed by all parties. Candidates then work through the 24 credit-hour program of study which spans a two-year period.

The Process

Initiating the QI Process

Fort Hays State University utilized a collaborative process to implement and work through the Quality Indicators. The FHSU process epitomized the saying, “The sum is greater than the parts.” Collectively, we had the information and the determination to complete the process in a timely manner. Having just completed Kansas State Department of Education/National Council for Accreditation of Teacher Education (KSDE/NCATE) accreditation, a clear direction and process were deemed essential.

The Quality Indicators (QI) project was designed to provide a foundation for alternative certification program self-assessment. During the first two years of the KNOTtT project, a task force designed a comprehensive framework of indicators of program quality and began to pilot those indicators with local districts that sponsored alternative programs. Revisions have been made at each level of design and after the alpha pilot was conducted. Fort Hays State University participated as a beta pilot site in December of 2010.

In the fall of 2010, leaders of the FHSU non-traditional teacher preparation program called Transition to Teaching began to meet as a team. They used the QI process and indicators developed by the KNOTtT/National Association for Alternative Certification (NAAC) Quality Indicators Project. FHSU utilized a collaborative process as they worked through the Quality Indicators. Individuals involved included the project director, two faculty members responsible for teaching much of the coursework, a licensure specialist, and the program specialist. Each individual’s role in the Transition to Teaching program at FHSU is unique. The director is the chair of the department that houses the program. She initiates meetings, represents the program on the KSDE and FHSU policy councils, and oversees the working of the program. The instructors are two of the five individuals that teach coursework for the program. These instructors are instrumental in developing and teaching the induction class that is the only face-to-face component of the program. The induction class is designed to get the newly hired teachers ready to begin their first teaching experience. The licensure specialist is the individual most versed in the Kansas licensure requirements. She works with each candidate from the time of initial interest in the program until coursework is completed and the candidate is recommended for licensure. The program specialist assists all other members of the program and is the first line of communication for all of the Transition to Teaching candidates.

The roles described above help to keep the program running smoothly, given the large numbers and large geographic area of the program. Just as each team member holds a specialized role in the program, each also played a specialized role in the Quality Indicator process. The director called meetings, set purpose, oversaw the overall project, and brought some of the history of the program to the study. The director has been involved with the project since its inception and has written three of the eight courses that comprise the program. One of the two instructors has been with the program since its inception, teaching courses each semester. The second instructor has worked with the project for the past several years, teaching courses and serving as advisor for the TTT candidates who desire to complete a Master of Science with the TTT coursework as an emphasis area. Both instructors have routinely taught the face-to-face induction class. They brought organization and structure to the QI process. The licensure and program specialists respond to initial inquiries for the program, analyze transcripts for content requirements for licensure, maintain communication with candidates, and devise programs of study. The licensure specialist brought rich history to the QI process that was not exhibited by other team members. The program specialist organized the team as the official "datatician," a term coined by the team to exemplify the key role this individual played in recording and organizing the discussions and documentation for the process. She also had a rich collection of the artifacts needed to provide evidence for achievement of the stages assigned for each dimension and component of the process rubrics.

Individuals had responsibilities between planned meetings, but it was the interaction during the planned meetings that energized the process to produce a meaningful product in the completed self-study. The five team members met formally as a group for five consecutive weeks in two-hour scheduled meetings. The first meeting was used mostly to acquaint the team members with the dimensions, the components of each dimension, and to talk through a process that made sense. After the first meeting, the team members decided to work through one dimension in each of the next four meetings and to use the final meeting to summarize and complete the strengths, weaknesses, opportunities and threats (SWOT) analysis.

Working Through the Process

The Quality Indicators are divided into three dimensions: governance, design and accountability. Each dimension is divided into four components: preparation, recruitment, selection, and support. Each component is then divided into four stages. The table below shows the rubric for Governance: Recruitment with the four stages. As the name of the process indicates, each stage lists a set of indicators that is used to determine the status of an alternative program for that specific dimension and component. There are a total of 12 rubrics, each with indicators at four stages that collaborators use to measure the development of their individual programs.

The content of the meetings centered on discussions comparing FHSU Alternative Certification program components to the quality indicators. Using the table below, the first conversation focused on asking what available program documents would

demonstrate accomplishment of indicators within each stage of the rubric. The first question then was, “What practice, policy, process, or document exists that demonstrates the program has identified Governance Roles for the recruitment process?” When a practice, policy, process, or document was identified, the next indicator in that stage was queried in the same manner..

Table 1: Dimension: Governance Component: Recruitment

Stage 1	Stage 2	Stage 3	Stage 4
Developing Program, Identifying Resources and Personnel	Implementing Program Procedures, Policies, and Collaboration	Analyzing Program Policies and Procedures	Advancing Program Sustainability and Continuous Improvement
1. Governance Roles are identified for the recruitment process. 2. Recruitment procedures are planned. 3. Recruitment Resources are Identified.	1. Recruitment partners are identified and consulted regarding recruitment processes and policies 2. Recruitment strategies are developed and implemented 3. Recruitment resources are secured, developed and allocated.	1. With partner input, program leadership systematically reviews recruitment processes and policies to ensure highest quality and to ensure that efforts are sustained. 2. Allocations of resources are modified as necessary to meet program needs.	1. With partner and stakeholder input, program leadership implements a plan for continuous improvement allowing for times of both low and high hiring needs. 2. Source of adequate financial and physical resources are guaranteed into the foreseeable future.

The team continued the process for each stage until confronted by the indicator or indicators for which the program had no practice, policy, process, or document that demonstrated achievement of that indicator. At that point, it was determined what stage the FHSU Alternative Certification Program had reached for each component of each dimension. Each of the team members held a different knowledge base regarding the FHSU Alternative Certification program. Through the collaborative conversations, team members were able to view and discuss all of the components of the FHSU program. These discussions proved beneficial to team members as each individually learned more about the FHSU program.

The datatician kept notes as the discussions unfolded. After each meeting, she would summarize the discussions and send out an e-mail with the meeting notes. She also would include the identification of any documents that needed to be located and who was responsible for locating the document and e-mailing it to her. The datatician role was critical in keeping everyone on track and keeping feedback and data organized and up to date.

When a document was identified that demonstrated attainment of an indicator, it was coded according to the indicator. Using the previous table, a document that verified FHSU had identified roles for the recruitment process would be codified GR1.1, meaning the document was for Governance, Recruitment, Stage 1, document 1. The second document in support of Governance Recruitment, Stage 1, would be codified GR1.2. The codified documents were then organized and titled to ensure consistency between the document title and document name. This process was significant to the submission of the self-study to the review team.

The self-study was reviewed by a team of Alternative Certification experts representing the National Association for Alternative Certification (NAAC). That team needed to be able to easily find documents that support program attainment of specific stages of the rubrics. The codification system then served two purposes. It helped the self-study team keep track of the process and it also provided the reviewers a systematic presentation of the documents for review.

Along with the coding system that was developed, a consistent set of phrases was used to describe how the Fort Hays assessment fit within the Quality Indicators. Sometimes referred to as “boiler plate” language, consistent statements from indicator to indicator assisted the reviewers in understanding the intent of the organization conducting the self-study. To that end, the FHSU consistent language for each indicator became, ”Through this process we believe we are in Stage . . . “ This statement was followed by the listing of coded documents that provided the evidence of achievement of that particular quality indicator.

Advantages of the Self-Study Process

The Quality Indicators provided multiple advantages and services to FHSU. As established, and due to the nature of Alternative Certification, the process to implement the Quality Indicator review was highly collaborative. No one person on the team held all the knowledge to complete the process in isolation. It took the whole team working collectively to explore and reflect on the components of the program. Reflection on the Quality Indicators as they pertained to the program was a major strength of the process. The identification of areas for improvement served as a basis for the SWOT analysis.

A significant advantage of the Quality Indicators and the process implemented at FHSU was the learning experience of the program participants. As stated earlier, no one individual held the information necessary to complete the process. Through the discussions, program participants learned more about the program parameters, thus enhancing the overall performance of the program.

While the Quality Indicators are not necessarily a target for all programs, they are a standard that provides affirmation of the qualities within programs. This affirmation is, in itself, an advantage of the process. Alternative Certification Programs have a tool that can affirm desirable characteristics of a program.

What FHSU Learned

A self-study can be a very time-consuming process. Time must be devoted to collaborative meetings as well as individual research and study. A collegial atmosphere enhances the self-study process and allows for meaningful dialog among program participants. Someone on the self-study team needs to keep the process moving by establishing checkpoints and coordinating meeting dates, times, and topics.

One of the real ahas! for the FHSU study team was that more stakeholders need to be involved in the process the next time the self study is conducted. No representatives from program candidates, partner school mentors and administrators, or community members were included.

It was important for FHSU to thoroughly discuss each of the Quality Indicators. Because of the parameters of the FHSU program regarding recruitment and selection, team members believed that the recruitment component of each dimension did not apply and, therefore, little discussion would be needed. Through the discussion process, it became apparent that more in the area of recruitment was accomplished than was originally believed. It is important to discuss program parameters for each Quality Indicator using the process to discover program components.

Strengths, Weaknesses, Opportunities, and Threats (SWOT Analysis)

An important step in the overall process is the completion of the SWOT analysis. This again was a process completed collaboratively among the program participants. The FHSU SWOT analysis identified thirteen strengths, six weaknesses, ten opportunities, and four threats. Some of the items identified were known to the program participants, but not in the same light as produced by the QI process.

The Role of the Review Team

The project review team reviewed the document submitted by FHSU during November of 2010. The two teams then planned a face-to-face meeting to discuss the submission and the Quality Indicator process. In December, the reviewers met in Kansas City, Kansas, to discuss the QI process with the FHSU team. All five members of the FHSU team participated in that discussion, which proved to be insightful and helpful.

A follow-up report was provided in February of 2011 that related the findings of the review team. The report highlighted components of the report, such as artifacts and evidence submission, program history and contextual descriptions, thoroughness of the submission, and a brief summary of the December meeting. Any conclusions presented in the report were intended to guide the revision of the Quality Indicators and the QI process.

Recommendations on the QI Process for the FHSU team

Because of the successful process of the FHSU team, several recommendations were developed and provided to the review team to support the next phase of the Quality Indicator process revisions.

1. Form a team of stakeholders to participate in the collaborative process. Include university and local agency personnel as well as community members and current and former candidates.
2. Provide team members with specific roles and a description of those roles, (i.e., Historian, datatician).
3. Establish a codification system for supporting documents.
4. Plan your commitment of time.
5. Set aside time for familiarizing your team with the QI process and rubrics.
6. Budget time to discuss and work through the process. For the FHSU team, that was a minimum of six, one-two hour blocks of collaborative time plus organizing time between meetings.
7. Space meetings sufficiently to provide individual reflection time and time to gather evidence and summarize the previous meeting's notes.
8. Provide a datatician with dedicated time to record discussions and organize documents and information systematically.
9. View the KNOTtT website for orientation and process and the video for uploading the document.
10. Take advantage of all KNOTtT training.
11. Provide exemplars, not as a definitive process, but as a reference tool.
12. Provide a glossary of terms.
13. Do not allow teams to opt out of dimensions or components; discussion is the driving force of the self study.

Summary

In summary, the FHSU team viewed the self-study as a valuable exercise in collaboration, a focused analysis of the program, and as an avenue to become more comfortable with the program itself and the individual roles within it. Suggestions for improvement were made that will enhance the program. Suggestions for improvement of the QI process were also made to the reviewers. The team is looking forward to continued work on the program having established a strategic plan, and to a second formal self-study in the near future.