SPECIAL EDUCATION TEACHER PREPARATION: AN ECOLOGICAL APPROACH TO PROFESSIONAL KNOWLEDGE OF SPECIAL EDUCATION AND TEACHING PRACTICES

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Education in the
College of Education
at the University of Kentucky

By

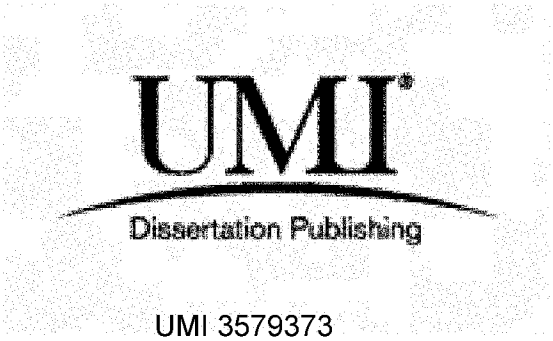
Deborah Knapp Schumacher

Lexington, Kentucky

Director: Dr. Robert G. McKenzie, Professor of Education

Lexington, Kentucky

2011



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This dissertation takes an ecological perspective by focusing on the interactions of program features, setting and people to examine factors in how teachers develop knowledge of special education and teacher practices, using a large graduate level special education preparation program for study. Scores on state teacher licensure tests are used as the measure for candidate knowledge in a statistical study of existing program data relating to candidate background (new to education or already certified), traditional or alternate route field settings, admissions grade point average, ethnicity, gender, cumulative hours and courses to predict candidate test scores. In a mixed methods approach, these data are combined with a qualitative component that explores candidates' perception of their individual knowledge trajectories. The findings extend the literature on traditional and alternate route teacher preparation programs, licensure testing, and disproportionality, and provide direction for program improvement recommendations to enable candidates from a variety of backgrounds to become knowledgeable and effective special educators.

KEYWORDS: Teacher Preparation, Special Education, Licensure Testing, Alternate Certification, Ethnicity

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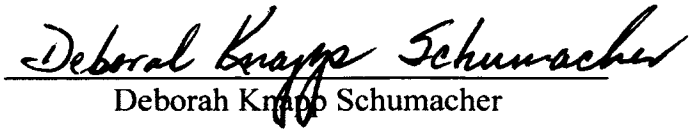

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Table of Contents

LIST OF TABLES

LIST OF FIGURES

Chapter One

Introduction

What teachers know and how they learn to teach is an important but under-studied area in teacher education (Bishop, Brownell, Klingner, Leko, & Glaman, 2010; Carter, 1990; Wideen, Mayer-Smith & Moon, 1999). Traditionally, a positivist stance has been taken in teacher development, where standards are set, the college teacher education program imparts knowledge, the local schools provide application of skills in the field, and the teacher candidate integrates all this into practice. Some approaches focus on the role of the entering candidate's beliefs and perceptions of self as learner and teacher in the process of development as a professional (Kagan, 1992). Others have taken a more complex, ecological stance on teacher development, looking to the interactions of program features, college and school settings, and people (i.e., school clinical faculty, college faculty, students and parents) on the candidate's knowledge and skills (Feiman-Nemser & Buchman, 1989; Wideen, et al.).

In a recent description of the status of research in the preparation of special education teachers, Sindelar, Brownell and Billingsley (2010) noted that the key professional journal dedicated to this topic, *Teacher Education and Special Education*, has only been published for 33 years. Such recency is provided as one explanation for the limited studies they found on special education teacher preparation, which led to their suggestions for a research agenda on innovations in initial preparation, mentoring and induction. In one example: "Clearly, we need to understand more about the features and sequencing of field experiences. For instance, should initial field experiences be more structured than experiences at the end of the program? ... [W]e need to know how virtual classrooms, video conferencing, and online mentoring can be used to develop applied

knowledge for teaching" (p.14). Not only is more research needed on special education teacher preparation practices, but also in the links between preparation, practices in the classroom and consequent outcomes for students (Goe & Coggshall, 2007).

One area of special education teacher preparation that has been studied in recent years is the growth of alternative route programs for addressing chronic shortages in special education teachers (Sindelar, Brownell, & Billingsley, 2010). An alternate route program permits bachelor-degreed candidates to teach in special education classrooms prior to completion of the teacher preparation program. In contrast, a traditional graduate-level initial certification program is one in which candidates complete all program requirements before being employed as special education teachers. Comparisons of alternate and traditional route programs have shown mixed results (Sindelar et al., 2010). For example, Sindelar, Daunic, and Rennels (2004) found that three types of programs all could produce basically competent teachers (i.e., traditional, university-school alternate route partnerships, and district alternate route programs) while Nougaret, Scruggs, and Mastropieri (2005) found significant differences in favor of traditionally prepared special educators. These studies, however, failed to describe the candidates in terms of their prior background, which creates a question as the appropriateness of the comparison. For example, a "traditional" graduate student could hold an undergraduate business degree and complete the special education program with non-paid practicum experience and student teaching, or could be a general education teacher completing a master's degree in special education while raising young children. Conversely, a person in an "alternate route" program could be an experienced general educator teaching special education while enrolled in an alternate route program, or could have no education background but be employed to teach special education while in the program. This failure

to describe candidate background and field context could explain contradictory results in other studies and lead to missing important issues in program delivery.

This dissertation takes an ecological perspective by focusing on the interactions of program features, settings and people to examine how teachers develop knowledge of special education and teaching practices. A large graduate level special education program with almost 500 graduates since 2005 was studied because the program is offered in both traditional and alternate route format. This program prepares teachers of students with high incidence disabilities in a cross-categorical area titled "learning and behavior disorders" (LBD), which includes specific learning disabilities, emotional and behavioral disabilities, mild cognitive disabilities, developmental delays for children under age nine years, and various other disabilities where students are likely to spend the majority of the day in the general education classroom. A mixed methods approach included a statistical study of existing program data that include candidate background and field experiences, combined with a qualitative component that explored candidates' perceptions of their individual knowledge trajectories. It was hypothesized that the candidates' previous education backgrounds, their applied classroom experiences and other ecological variables would have a significant impact on their knowledge of special education and classroom practice. The findings extend the literature on teacher preparation programs and provide insight for issues in the field and direction for program improvement recommendations to enable candidates from a variety of backgrounds to become knowledgeable and effective special educators.

Chapter Two

Review of the Literature

Learning to Teach

What teachers know and how they learn to teach is an important but under-studied area in teacher education (Bishop, Brownell, Klingner, Leko, & Glaman, 2010; Carter, 1990; Wideen, Mayer-Smith & Moon, 1999). Existing studies in teacher education have typically focused on imparting knowledge to teachers: "For the most part, attention in teacher education has traditionally been focused on what teachers need to know and how they can be trained, rather than on what they actually know or how that knowledge is acquired" (Carter, p.291). In a review of 93 empirical studies on learning to teach, most of the studies were based on this traditional model and had limited measures of actual teacher knowledge (Wideen et al.). Furthermore, most studies did not include an ecological approach to address the role that preparation, school experiences and other situational variables play.

The relationship of professional knowledge to teaching practice can be viewed from different perspectives, which has implications for the role and importance of professional knowledge in the classroom (Tom & Valli, 1990). A recent study of beginning special educators concluded that the path from knowledge to classroom practice is not linear and that the personal attributes of teachers, preparation experiences, and the school environment all contribute to appropriate teaching practice (Bishop, Brownell, Klingner, Leko, & Glaman, 2010).

Beginning Teacher Quality: Measures of Knowledge

Teacher knowledge has become a concern in an era of accountability in teacher education, and state legislatures have mandated high-stakes tests of beginning teachers'

content knowledge (e.g., math, English) and pedagogical knowledge and practice. In special education, the "content" has focused traditionally on identifying and responding to the learning needs of students with disabilities rather than knowledge of the general curriculum. However, since the passage of the federal No Child Left Behind Act of 2001, there has been a move to include subject matter expertise as part of beginning special educator knowledge and practice (Brownell, Bishop, Gersten, Klingner, Penfield, Dimino, et al., 2009; Brownell, Sindelar, Kiely, & Danielson, 2010). Use of content tests has raised construct validity questions, especially in the 1980's when little predictive validity was found between the National Teachers Exams (NTE) in use between 1943 and 1992 and teacher performance (D'Agostino & VanWinkle, 2007). As a result, a totally new system based on a construct validity process replaced the NTE in 1992. At the pre-service level, candidate knowledge is now commonly measured by tests such as the Praxis™ II Series (Educational Testing Services [ETS], 2008c), which includes both tests of content and pedagogical knowledge of teaching processes and practices. The Praxis™ II tests are used by many states in licensure decisions, and the selection of tests used by states along with state-specific cut-off scores are readily available from the ETS website. As a measure of candidate knowledge about special education and teaching practices, Praxis™ II tests include both multiple choice and constructed response formats. There is some support for use of Praxis™ II category subscores rather than total test scores in providing more information for preparation programs (D'Agostino & VanWinkle; Sutton, Bausmith, O'Connor, & Pae, 2010).

Other common methods of evaluating a teacher's knowledge about curriculum, teaching strategies, and students include review of lessons plans. For example, in one commercially available assessment system, Praxis™ III, lesson plans are used to assess

knowledge (Dwyer, 1994). Teacher classroom practices are also assessed with process-product direct observation measures that record specific teacher behaviors (i.e., process) and the effect on student responses (i.e., product). Other alternatives include evaluation checklists of teacher behaviors; professional standards of practice; large-scale surveys of teacher behaviors; and/or commercially available observation systems (Blanton, Sindelar, & Correa, 2006). Process-product, low-inference direct observation measures of teacher effectiveness have been used successfully since the 1970's, particularly in special education. For example, Espin and Yell (1994) rated a set of teachers as *highly effective*, *moderately effective* and *less effective*, then collected direct observation data on the three groups of teachers and compared differences in specific teaching behaviors and student outcomes. They found that critical indicators of teacher effectiveness were the types and rates of teacher responses to students (i.e., positive, negative and behavioral prompts), which were in turn correlated to the per cent of time students were academically engaged versus involved in off-task and intrusive behaviors. These findings follow closely with previous process-product research (Brophy & Good, 1986; Rosenshine & Stevens, 1986). An alternative observation approach to low-inference tools are measures based on teaching standards, although there is limited if any research on the use of the standards as a measure of assessment (Blanton, et al., 2006). Similarly, special education teachers in the field generally support most of the Council for Exceptional Children standards for special educators, but most teachers find them difficult to implement in practice (Council for Exceptional Children, 2009; Zionts, Shellady, & Zionts, 2006). Consequently, although standards are part of teacher preparation program accreditation, there is limited empirical study of these measures or their link to teacher effectiveness.

Teacher Preparation Program Delivery

Many states have moved to alternate route programs to address teacher shortages because of low numbers of special education teachers graduated through traditional preparation programs, compared to the numbers of teachers needed in the field (Rosenberg, Boyer, Sindelar, & Misra, 2007). An alternate route preparation program permits bachelor-degreed candidates to teach in classrooms before completing the teacher preparation program; in "traditional" graduate-level preparation programs, candidates complete the program prior to classroom teaching. Another emerging service delivery area is online special education preparation programs, particularly at the masters' degree level (Bullock, Gable, & Mohr, 2008). In fact, there is an overlap between these two developments, as 68 percent of special education alternate route programs use distance learning (Washburn-Moses & Rosenberg, 2008).

Alternate and traditional route programs. One area of special education teacher preparation that has been studied in recent years is the growth of alternative route programs to address chronic shortages in special education teachers (Sindelar, Brownell, & Billingsley, 2010). In a review of the history of alternate route programs, Suell and Piotrowski (2007) identified three critical elements of these programs: "a strong academic coursework component, field-based learning in the classroom, and support from qualified mentors" (p. 54). One of the studies they reviewed compared the instructional behaviors and student outcomes for alternate and traditional route secondary content teachers; that study found no differences (Miller, McKenna & McKenna, 1998). However, the issues in alternate routes in special education preparation are quite different from preparing secondary content teachers, and caution is needed in applying research

from general education to special education (Rosenberg, Sindelar, Connelly, & Keller, 2004).

Comparisons of alternate and traditional route programs in special education have shown mixed results (Sindelar et al., 2010). For example, Sindelar, Daunic, and Rennels (2004) found that three types of programs all could produce basically competent teachers (i.e., traditional, university-school alternate route partnerships, and district alternate route programs). On a different note, Nougaret, Scruggs, and Mastropieri (2005) found significant differences in favor of traditionally prepared special educators. However, there is a lack of analysis of the candidates in terms of their prior background in either of these approaches (i.e., traditional or alternate route), which creates a question as to who was actually being compared. Rosenberg and Sindelar (2005) identified two studies that compared alternate route and traditional special education teacher candidates using moderate-inference tools (i.e., Praxis™ III, Dwyer, 1994) and concluded that "ARC [alternate route certification] programs can produce competent teachers, but not all ARC's are alike." (p. 123). In a study of alternate route programs, Rosenberg, Sindelar, Boyer and Misra (2007) reported on a national descriptive database of these programs and found that "AR [alternate route] programs are heterogeneous in length, support, and program intensity; and educators and policymakers must not view programs that deliver a research-based curriculum in a coherent programmatic fashion in the same light as those that make little or no effort to do so" (p.238).

Distance education and online course delivery. Distance education started in the U.S. at the end of the 1900's as correspondence courses. However, recent changes in special education teacher education preparation have resulted in a shift to emerging online or Web-based delivery, which Bullock, Gable and Mohr (2008) noted will result in

major instructional design shifts if the trend continues. Much of the current literature provides information on strategies for instruction, such as discussion boards, blogs, and wikis (Canter, Voytecki & Rodriguez, 2007). Empirical studies have compared distance education or Web-based coursework with face-to-face instruction and found that student perceptions, satisfaction and course outcomes were generally similar between the two formats (Braun, 2008). However, there remains a gap in research on the impact of online programs on teacher practice or student outcomes.

Field experiences, supervision and mentoring. Exemplary general education and special education preparation programs generally consist of critical features, such as extensive, well-planned and well-supervised field experiences (Brownell, Ross, Colon, & McCallum, 2005). However, the manner of providing and supervising field experiences has had little study, and there is a need for comparison studies that can control for the variation across programs. In a national survey of undergraduate special education teacher practices, Conderman, Muril, and Stephens (2005) reported that supervision quality is key to program quality. However, this is a challenge due to lack of university resources and locating appropriate sites.

Hixson and So (2009) provided a review of technological innovations used to enhance or replace some field experiences, such as pre-service teacher use of video conferencing to observe classrooms with diverse student populations. For example, use of interactive video conferencing has broadened candidate experiences beyond the single placement per semester (Bello, Knowleton & Chafin, 2007). Video conferencing has also been applied to supervision where off-site college faculty can observe the candidate teaching in a classroom, a strategy becoming increasingly popular as "cybermentoring" (Johnson, Maring, Doty, & Fickle, 2006). In a study comparing onsite and offsite

supervision using a low-inference, direct observation instrument, Dymond, Renzaglia, Halle, Chadsey and Bentz (2008) found that interobserver agreement between onsite and offsite observations was possible, with a mean of 86% agreement. Faculty can also provide discrete off-site feedback through Web-based communication and wireless technology known as "bug-in-ear" (Wade, 2010). Gentry, Denton and Kurz (2008) conducted a synthesis of research of technologically-based mentoring and found that, while results were positive across a variety of formats, virtually all studies relied on teacher self-reports with no direct observation of changes in teaching practices or student outcomes. Consequently, they called for empirically based research in this area. Similarly, Dempsey, Arthur-Kelly, and Carty (2009) found face-to-face interactions, scheduled meetings, and online options (e.g., discussion board, email, text-chat, video conferencing, web-based professional learning communities) well-received but needing further data. Furthermore, the interactions among college field supervisors, local mentor teachers and candidates in support of teaching practices has not been studied, including online preparation programs where the field experience is also at a distance to the college campus.

Purpose of the Study

This dissertation takes an ecological perspective by focusing on the interactions of program features, settings and people to examine how teachers develop knowledge of special education and teaching. The information gathered is intended as a source of recommendations for program adjustments to improve results for teacher candidates in mild disabilities, i.e., LBD. More specifically, the purpose of the study is to investigate different levels of knowledge and skills of special educator candidates at key points in their teacher preparation programs, based on the candidate's pre-program background,

types of field experiences during the program, course work sequence and mentored experiences. It was hypothesized that the candidates' previous education background as well as the nature of their field experiences and employment context would have a significant impact on their knowledge of content and classroom practice, as measured by Praxis™ II licensure tests (ETS, 2008a-b). In a simple model, the independent effects of the background and field context were examined for correlation with the test scores, to determine how well these variables predict candidate knowledge. This simple model was compared to a more complex model where other variables were also considered for their predictive value. These other variables included general achievement as measured by undergraduate GPA and program sequence variables as measured by cumulative program hours and clusters of courses successfully completed prior to testing. The research questions were the following:

(1) Is there a difference in the professional knowledge of special education and teaching practices for initial special education candidates as measured by Praxis™ II licensure tests, based on

   (a) their prior background (i.e., prior teacher certification in another area extended to LBD, or initial teacher preparation), and/or

   (b) their field context in the program (i.e., employed as an LBD teacher in an alternate route program or obtaining classroom experiences in traditional ways)?

(2) How well do prior background, field context, and other variables (i.e., cumulative program hours, clusters of program courses successfully completed and general candidate achievement) explain candidates' levels of professional knowledge in special education and teaching practices?

(3) To what do candidates attribute their development of content and pedagogical knowledge in special education and teaching?

In addition to recommendations for program adjustments to improve outcomes for candidates, the findings add to the literature on alternate and traditional route programs, as suggested by Rosenberg and Sindelar (2005) and Sindelar, Brownell and Billingsley (2010).

Chapter Three

Methodology

Overview

This study focused on a graduate-level special education program at ABC College, which is located in the Midwest near an urban area and provides both alternate route and traditional preparation to a large number of candidates across the state in rural, urban and suburban schools in a 200-mile radius. ABC College is a small, liberal arts college with roots dating to 1787. The College's only graduate level program is Education, which has provided advanced degrees and preparation for certified teachers since 1957. In 2003, an initial graduate-level certification program in special education for mild disabilities (i.e., LBD), was established as both an alternate and traditional route program leading to certification. Since then, 484 candidates have completed the LBD program, receiving both a master's degree and recommendation for full LBD certification, and 359 are currently enrolled at various points in the preparation process, following a rolling enrollment every semester rather than a cohort system.

Based on an ecological stance, a mixed methods approach to examining content knowledge of special education and teaching practices included a statistical study using correlational analyses and regressions from existing program data on individuals who are enrolled in or have completed the program. This statistical study was designed to answer Research Questions 1 and 2 regarding differences in candidate's content and pedagogical knowledge based on pre-program background, field experiences and other program variables. Because many of the program features are constant across students, candidate knowledge can be studied for variables of interest. In addition, a complementary, qualitative component was designed to address Research Question 3, using a focus group

interview process with current enrollees and graduates to explore issues and themes of how they perceive their own knowledge of special education content and practices has developed. The qualitative study was a follow-up to the statistical study and was designed to provide insights into the knowledge development from the candidates' perceptions, to extend and provide social validity for conclusions and recommendations.

Description of a Preparation Program for Study

Program curriculum. The ABC College graduate program in LBD demonstrates a number of the features described previously for special education teacher preparation programs, and it is approved by the state teacher licensure board as both a traditional and an alternate route graduate program. Candidates receive the same core course work under both routes. However, based on prior education background, two courses are interchanged for individual students. Course delivery is online in a blended format, where all course content is implemented through web-based technologies, but the program also contains some face-to-face components, which specifically include the field practice contained in three field courses of increasing intensity. Technologies are used in course content delivery, such as course management systems, synchronous text chats, video clips and desktop audio conferencing. As an online program, candidates are accepted from around the state with field experiences made available within a 200-mile radius. Approximately 325 candidates are enrolled in the program at any one time, with an average of 180 in a field experience course each fall and spring semester, and approximately 100 candidates completing the program and receiving certification and a masters degree each year.

Education background. Table 3.1 summarizes four types of candidates based on prior background and field practicum context. As described in Table 3.1, ABC College

prepares candidates from different educational backgrounds: those adding an LBD certificate to an existing teaching certificate (Cells 1-2) as well as those who hold a non-education bachelor degree and are beginning their teaching careers through the program (Cells 3-4). All of the candidates in the four cell groups participate in a standardized curriculum including special education and related courses. However, the candidates with a teacher education background have generally already completed courses in reading and math methods; consequently, they substitute two courses on research methods and develop and implement action research in the classroom. Conversely, those without teacher background take a course in reading methods and a course in math methods rather than the two research methods courses.

Table 3.1, ABC College Candidates by Undergraduate Background and Field Practicum Context

Undergraduate Background	Practicum Context for Field Experiences	
	Employed as an LBD Teacher	Traditional Graduate Practicum Experience
Already-Certified: LBD as Certificate Extension	Cell 1 Certified/LBD Teacher • Candidate with other certification who is employed as an LBD teacher • Completes "practicum" within LBD position • Completes core LBD courses plus action research	Cell 2 Certified/Traditional • Candidate with other certification who is not employed as an LBD teacher • Completes traditional practicum experiences • Completes core LBD courses plus action research

Table 3.1 (continued)

	Cell 3 New/LBD Teacher	Cell 4 New/Traditional
New to Education: LBD as Initial Certificate	• Candidate without previous teacher preparation hired as an LBD teacher • Completes "practicum" within LBD position • Completes core LBD courses plus reading/math methods courses	• Candidate without previous teacher preparation • Completes traditional practicum experiences • Completes core LBD courses plus reading/math methods courses

Field/practicum context. In addition to differentiation by background, candidates are differentiated by whether they are employed as an LBD teacher; this is reported as "Employed as an LBD teacher" while completing the program (Cells 1 and 3). The other candidates who are not LBD alternate route teachers are enrolled in a traditional track where they complete the program experiences prior to employment as an LBD teacher (Cells 2 and 4). In the alternate route, the candidate seeks school employment as a special educator. If hired by a local school district, then a 1-year renewable certificate is processed as a university-local district partnership, contingent on continuous enrollment in the preparation program and special education mentoring jointly provided through the university and school. These candidates in Cells 1 and 3 receive field experiences through their special education position, formalized in a school mentoring agreement. Other candidates who are not employed as LBD teachers receive their special education field experiences in one of several more traditional ways. For example, those candidates not employed in a school are placed as a volunteer in a school with a special education

mentor teacher, ultimately leading to student teaching as their final clinical practice setting. This context is similar to traditional undergraduate programs. Another way is for those already employed in a school (e.g., general education teachers) to complete the required experiences based on an agreement between the candidate, principal and college for specific hours, activities and/or release responsibilities, ultimately leading to a clinical practice equivalent to student teaching.

Each of the three field courses includes an online content component with the course instructor and provides a local onsite mentor teacher and a faculty mentor/supervisor for off-site consultation, review of field assignments, and onsite observation and feedback. As described earlier, the context for the field experiences varies based on the field status of the candidate. Over the three field courses, the experiences and the amount of time in instruction increase in intensity, with the third field course providing final clinical practice.

Regardless of practicum context, local mentors are experienced masters level special educators identified in conjunction with the local school district of employment or residence, and college supervisors are currently practicing or recently retired local practitioners, trained and coordinated by ABC. Field assignments and mentoring practices that are currently part of the initial field experience course include (1) readings; (2) course content and online text chat; (3) video clip presentations and audio desktop conferencing on writing behavioral objectives, explicit instruction, reinforcement, and increasing student response rates (engagement); (4) field assignments for lesson planning; (5) reflective journaling; (6) practicum hours for initial field experiences: 60 minimum LBD field experience hours and 15 hours minimum local mentoring; for final clinical experiences: 10 weeks or equivalent of LBD field experiences and 30 hours

minimum of local mentoring; (7) off-site and on-site observation/feedback from a college faculty observer; and an (8) end-of-semester rating by the local mentor based on the program's conceptual framework standards.

Procedures for the Statistical Study

Statistical Study Participants

For data to address Research Questions 1-2, permission was granted by ABC College to utilize existing program data for analysis; a copy of this permission is contained in Appendix A. Participants were assigned a unique identification code separate from the College identification number to protect individual confidentiality and assure a blind analysis. No data are presented in a personally identifiable form, and no groups of less than five are reported, in keeping with standard procedures for reporting of group data. Table 3.2 provides basic information on all LBD program graduates in the pool to be included in the statistical study. In 2007, one of the tests used for LBD teacher certification in Kentucky changed although candidates had been allowed, beginning in 2005, to take either the new or the previous test for certification purposes. Therefore, only graduates after August 2007 were considered. Graduates are reported by the academic year (i.e., December 2007 and August 2008 completers are 2008 graduates), and all 2008, 2009, and 2010 graduates were included in the statistical study.

Table 3.2, LBD Program Graduates in the Statistical Study

Status	N	Background		Field Context *		Gender		Ethnicity	
		Certified	New	LBD	Traditional	M	F	White	Other
2008 Grad	91	23	68	77	14	23	68	84	7
			74.7%		15.4%		74.8%		7.7%
2009 Grad	79	24	55	56	23	18	61	69	10
			69.6%		29.1%		77.2%		12.7%

Table 3.2 (continued)

2010 Grad	99	33	66	68	31	21	78	86	13
			66.7%		31.3%		78.8%		13.1%
Total	269	80	189	201	68	62	207	239	30
Graduates			70.3%		25.3%		77.1%		11.2%
In Study									

Note. Percentages represent the number in the group out of the total number for the year. * $p < 0.05$.

Table 3.2 also provides an analysis of the graduates by (1) their pre-LBD program background; (2) the field context or setting in which they acquired field experiences and practiced LBD skills during the program; (3) gender; and (4) ethnicity. A candidate's background or previous college preparation may represent either (1) teacher education including a teaching certificate in an area other than LBD, indicated as "Certified", or (2) no previous teacher preparation, where "New" on the table means that they are new to education. The field context may be either (1) as an LBD teacher in a classroom under a Temporary Provisional certificate while enrolled in an alternate route preparation program, indicated on the table as "LBD", or as a traditional candidate who completes LBD field experiences in the preparation program prior to employment as an LBD teacher, indicated as "Traditional". Because candidates may change employment status as an LBD teacher during the program, Table 3.2 shows the graduates' field setting status at the time they completed the program. In the table, each group is reported as a percentage of the number of graduates by graduation year, as well as the percentage overall for all three years of graduates. There are three-year trends toward graduates who are more diverse; more often pursuing special education as a certificate extension (i.e., already hold another certificate); and more often in a traditional context for field experiences.

However, the only significant difference between the years is the increase the number of traditional route candidates (1, 269; $p = 0.027$, *chi square* = 7.240).

In addition to the graduates, a pool of candidates was also considered for study, labeled in Table 3.3 as "Others Possible". These candidates were admitted into the program prior to December 31, 2010, the cut-off date for the statistical study, but had not yet completed the program by that time. From this group, student records were removed from study if the candidate (1) had earned 0 hours in the program as of the cut-off date; (2) had not taken either of the current Praxis tests required for Kentucky certification (i.e., the dependent variables in the study); (3) withdrew with 14 or fewer hours in the program; or (4) became inactive prior to August 2007 with 14 or fewer hours in the program. Although candidates may take the Praxis tests anytime during the program, they are not required to take a test before 14 hours. Therefore this number of earned hours was used as a benchmark so that all records of candidates with unsuccessful testing were included to accurately depict the total picture, while culling the records of those candidates where inactivity or withdrawal from the program was unlikely to be motivated by unsuccessful testing. After culling, all the remaining candidates from the group were included as study participants and identified as "Others in Study" in Table 3.3. The field context for these students is their LBD teaching status as of the cut-off date for the study, which is different than the effective date used in Table 3.2 where their employment status at the time of graduation is used. As can be seen in Table 3.3, those candidates whose records remained in the statistical study were more likely to be new to education, teaching LBD on a temporary provisional certificate, and from a diverse ethnic background, compared to the records of the other possible candidates.

Table 3.3, LBD Program Candidates Not Yet Graduating

Status	Number	Background		Field Context		Gender		Ethnicity	
		Certified	New	LBD	Traditional	M	F	White	Other
Others	634	221	413	148	486	203	431	590	44
Possible			65.1%		76.7%		68.0%		6.9%
Culled	397	155	242	34	363	122	275	379	18
			60.9%		91.4%		69.3%		4.5%
Others	237	66	171	114	123	81	156	211	26
in Study			72.2%		51.9%		65.8%		11.0%

Note. Percentages represent the number in the group out of the total number for the year.

Table 3.4 combines the 2008-2010 graduates and those not yet completing the program to reflect all participants in the statistical study. As can be seen, graduates are more likely to be teaching LBD on a Temporary Provisional certificate than those not yet completing, probably reflecting a greater likelihood of obtaining a teaching position after a greater amount of preparation, i.e., the longer in the program, the more likely the candidate has obtained an LBD teaching position (1, 506; $p = .000$, *chi square* = 51.333). An interesting point is that there is a greater percentage of men in the group who have not yet graduated than in the group who have already graduated (1, 506; $p = .006$; *chi square* = 7.697), which may reflect a trend toward more men entering the field and/or more secondary level teachers.

Table 3.4, LBD Program Participants in the Statistical Study

Status	Number	Background		Field Context**		Gender **		Ethnicity	
		Education	New to Ed	LBD Teach	Traditional	M	F	White	Other
Graduates	269	80	189	201	68	62	207	239	30
			70.3%		25.3%		77.0%		11.2%
Others in	237	66	171	113	123	81	156	211	26
Study			72.2%		51.9%		65.8%		11.0%
TOTAL	506	146	360	315	191	143	363	450	56
			71.1%		37.7%		71.7%		11.1%

Note. Percentages represent the number in the group out of the total number for the year. ** $p < 0.01$

Investigator. The investigator of this study has been a part-time instructor in the ABC College LBD program since fall 2006, teaching each of the three field courses in different semesters. In fall 2009, the administrative role of field placement coordinator for the LBD program was added, and beginning in fall 2010, the LBD program co-director role as well. Access to the current and past program data on all graduates and enrollees was part of the administrative role, making it important to conduct the statistical analysis by unique identification codes.

Dependent Variables

Professional content and pedagogical knowledge. For the purpose of this study, the candidate's knowledge of special education and teaching practices is defined through total test and test category scores on two different measures developed as part of the PRAXIS™ II Series (Educational Testing Services, 2008c). Following professional standards for testing in education (AERA, APA, & NCME, 1999), the PRAXIS™ II test series was developed through job analyses for knowledge and skills necessary for

beginning practice, in this case for special education teachers. In the test development process for construct validity, national advisory committees used professional standards to create the specifications for the test, which was then created and field-tested, followed by item analysis to determine statistical merit, content issues and differential item functioning. As a result, PRAXIS™ II tests are generally considered to be reliable and have construct validity on knowledge and skills necessary for "safe and effective entry-level practice" (ETS, 2008c, p. 7), leading to use for licensure purposes in 39 states.

The first knowledge outcome measure is a 60-item, 60-min multiple choice test covering content and pedagogical knowledge of disabilities, special education, interventions and strategies across all areas of disability: PRAXIS™ II #0353 Education of Exceptional Children: Core Content Knowledge Test at a Glance (Educational Testing Service, 2008a). This test is used in preparation program and licensure decisions for special educators in many states, including the state where ABC College is located, where the state teacher licensure board requires a passing score for all special educators across disability areas. The three content categories used in the test design and identified for test-takers are described in Table 3.5. In the Test at a Glance, ETS provides an outline of the topics that may be addressed in each of the test categories, along with sample questions and explanations of responses; this document is in Appendix B.

Table 3.5, Praxis Test #0353 Education of Exceptional Children: Core Content Knowledge

	Test Content Categories	Approximate Number of Questions (out of 60 questions)	Approximate Percentage of Examination
I.	Understandng Exceptionalities	15-18	25-30%
II.	Legal and Societal Issues	9-12	15-20%
III.	Delivery of Services to Students with Disabilities	30-36	50-60%

As an interval measurement, the #0353 test has a scale score range from 100-200. Based on 29,565 test takers as of 2008 and with test statistics averaged across test administrations to that date, the median score is 174 and the mean is 172.3, with average performance range of 164-182, standard deviation of 14.1, standard error of measurement of 7.4, and reliability of 0.76 calculated on an internal consistency estimate (ETS, 2008a). According to the technical manual, the error of measurement is 0 because no error can be made given mechanical scoring. Although 0 error is unlikely, mechanical scoring does minimize scoring errors. As set by the state licensure board where ABC College is located, the cut-off score on this test for licensure as a special educator in any special education category is 157, which is slightly more than one standard deviation below the mean. All graduates of the ABC program must receive at least a 157, but by state policy, may retake the test as often as required if not meeting the minimum score. For this study, the initial test score was the one used, which allows a full range of scores by including all

those below 157. In addition to reporting the overall scale score, ETS also provides individual test takers with their raw score for each category on the test, with the raw score being the number correct out of the 60 item, along with the average range of raw scores for that particular test administration date. The raw score can provide the individual test taker and institution with potential areas of strength and weakness across the categories, though the technical manual cautions that the category score is less reliable than the overall score because the raw scores have not been equated across test forms.

The second knowledge outcome measure is a 60-min constructed response test that addresses the application of behavioral, diagnostic and instructional strategies to specific scenarios involving students with learning and behavior disorders: Praxis™ II #0542 Education of Exceptional Children: Mild to Moderate (Educational Testing Services, 2008b). This test is used in preparation program and licensure decisions in a number of states which have cross- or non-categorical licensure related to students with mild to moderate disabilities, such as learning disabilities, emotional/behavioral disabilities, and mild cognitive disabilities. It is used in the state where ABC College is located specifically for licensure of LBD teachers. Test-takers are expected to use their knowledge to write goals and short-term objectives from available assessment and behavioral data and to identify applicable strategies for given students and contexts. As shown in Table 3.6, in the Test at a Glance, ETS provides an outline of the topics that may be addressed in each of the test categories, along with sample scenarios, constructed response questions, sample responses and scoring information; this document is Appendix C.

Table 3.6, Praxis Test #0542 Education for Exceptional Children: Mild to Moderate Disabilities

Test Content Categories	Approximate Number of Questions (5 scenarios)	Approximate Percentage of Examination
I. Assessment	1-2	25-42%
II. Curriculum and Instruction	1-2	25-42%
III. Structuring and Managing the Learning Environment	1-2	25-42%

Like the #0353 multiple choice test, the #0542 test has a scale score range of 100-200 (ETS, 2008c); however, #0542 consists of five scenarios for constructed responses. Based on 9,835 test takers as of 2008 and test statistics averaged across administrations, the median score is 178 and the mean is 177.2, with average performance range of 170-185 and standard deviation of 11.6 (ETS, 2008b). The error of measurement is 3.6 based on two persons scoring each test; however, the technical manual indicates that internal reliability and standard error of measurement are not calculated because there are too few items, suggesting that the provided error of measurement is conservative. The cut-score set by the state teacher licensure board for LBD licensure is 172, at the low end of average performance. All graduates of the ABC program must receive at least a 172, but may retake the test as often as required if not meeting the minimum score. The initial test score was the one used in this study. Like for the #0353 multiple choice test, ETS provides the individual test taker a total scale score as well as the raw score for each test category, to allow the individual test taker and institution to identify potential areas of strength and weakness across categories. In the constructed response test, the raw score is

the sum of the scores by the two scorers, and each item is scored on a 3, 2, 1, 0 scale with a 3 demonstrating a thorough understanding of the topic represented in the scenario item.

Independent Variables for Research Question 1

Following the ecological perspective, the independent variables that were hypothesized to have an effect on candidates' content and pedagogical knowledge related to program features, people, and settings. The two specific variables of interest for Question #1 were the candidates' college pre-program teacher preparation background and the context of the field experiences while in the program. The first research question asked whether there is a difference in level of content knowledge, based on these two variables, which are operationally defined as follows.

Background. This is the candidate's pre-LBD program background, categorized dichotomously as either "Certified" or "New". To be considered as having an Education background, the candidate's undergraduate and/or previous graduate degree must be teacher preparation and certification. The ABC College LBD program is designed to recruit and prepare candidates from both types of backgrounds, particularly drawing in candidates new to education to expand the number of special educators in Kentucky based on ongoing state and national teacher shortages in this area. Consequently, if the data were to show that there is a difference between candidate knowledge based on pre-program background, then recommendations would need to provide direction on program differentiation by background (e.g., candidates without an education background might need different or additional courses or experiences).

Field context. This is the candidate's context for LBD field experience during the program, categorized dichotomously as either "LBD" teaching or as "Traditional" graduate practicum. To be considered LBD, the candidate must be employed by an

elementary or secondary school as a special education teacher for students with learning and behavior disorders, licensed through a temporary provisional LBD certificate (alternate route). Candidates in the traditional category receive their LBD field experiences through more common contexts for graduate education preparation of adults where the candidate and the College arrange LBD experiences either through flex-hours around the candidate's current school position (e.g., school-based general education teaching) or like undergraduate preparation, through unpaid practicum placements and student teaching arranged with a local school district. Because most candidates come into the program seeking employment as a special educator, they may change status from traditional practicum to LBD teaching during the program when they are hired as an LBD teacher. In this case, the candidate is identified under the field context in effect at the time the candidate took each Praxis test the first time. As an added complexity, LBD teachers with temporary provisional certificates are on annual contracts and may not be continuously employed in LBD throughout their entire graduate program. Therefore, for study purposes, once the candidate has been identified as LBD, this teaching status is continued because the experience gained through the LBD Teacher context cannot be unlearned or removed. Similar to the candidate pre-program background variable, if the data were to show a difference in knowledge based on field context, then recommendations would need to address differentiation for candidates according to context for their LBD field experiences (e.g., candidates not employed in LBD teaching positions need more or different field experiences or coursework).

Additional Independent Variables for Research Question #2

Question #2 considered the explanatory power of the candidate's prior background and field context and asked how well these two variables and other plausible

alternative explanations explain the candidates' level of knowledge. Additional independent variables are defined as follows.

Background-context cell. As outlined in Table 3.1, there are four cells which combine pre-program teacher preparation background and the field context for LBD experiences while in the program. Cell 1 consists of already-certified candidates who are adding LBD to extend their certification and who have been employed as an LBD teacher during this preparation (i.e. "Already Certified, Teaching LBD"). Cell 2 consists of already-certified candidates who are not serving as an LBD teacher but are completing their LBD preparation through traditional graduate practicum (i.e., "Already Certified, Traditional Field Experience"). Cells 3 and 4 are new candidates to the field where LBD will be their initial certificate. Cell 3 consists of initial candidates who are teaching in an LBD position while in the program (i.e., "Initial, LBD Teaching"). Cell 4 is initial candidates who complete traditional field experiences, including student teaching (i.e., "Initial, Traditional Field Experience"). Because the candidates may take the tests at two different times, the candidate's placement in a cell may change between the two testing dates when becoming newly employed in an LBD teaching position. Therefore, there are two variables, the "#0353 Cell" at the time of taking the Praxis #0353 test and the "#0542 Cell" for the other test.

Candidate GPA. The candidate's undergraduate grade point average (GPA) is an interval measure of academic performance ranging from 0.0-4.0 with 4.0 as high representing a grade of A. GPA is also a facsimile for early academic commitment. Although ABC College sets a minimum undergraduate GPA of 2.75 for admissions, candidates may substitute an acceptable score from a test used nationally by many institutions for graduate school admissions (i.e., the GRE® General Test [Educational

Testing Service, 2010]). Consequently, the undergraduate GPA of LBD graduate candidates may range from the level allowed for completing a baccalaureate degree at the undergraduate institution (e.g., 2.0 to a 4.0). As a general academic performance measure, the undergraduate GPA may account for part of the variance in knowledge as measured by #0353 and/or #0542 Praxis test scores. Similar to candidate background or field context, if the data were to show that professional knowledge is related to undergraduate GPA, then recommendations would be needed for differentiation for candidates based on entering GPA (e.g., candidates with entering GPA in a certain range may need additional monitoring and supports).

Program sequence. All candidates take the same set of courses except for the two research methods courses that certified teachers substitute if they have already taken reading and math methods courses. The ABC LBD program has rolling enrollment where a candidate may start any semester, is not grouped with a specific cohort during the program, and may complete the program in different time frames although there are certain prerequisite and sequence requirements. Table 3.7 describes the program courses and sequence taken by the candidates, clustered by exceptional child education courses which have an "ECE" prefix; LBD field courses which are three specific ECE courses and general education methods courses which have an "EDU" prefix.

Table 3.7, Program Courses Taken by All LBD Candidates

Course	Sequence	Course Content
	Cluster of Exceptional Child Education Methods Courses	
ECE 500 Educational Evaluation	Taken in first 20 hours	Educational evaluations, IEP development, classroom assessment
ECE 501 Behavior Management	Initial course	Behavior and classroom management, discipline, positive behavior supports
ECE 502 Introduction to LBD	Initial Course	Introduction to disabilities, special education, due process procedures, service delivery
ECE 503 Educational Programming in LBD	Taken in first 20 hours	Instructional methods, strategies, lesson and unit planning in specific content/skill areas
ECE 504 Collaboration in LBD	Taken in first 20 hours	Collaboration, interpersonal skills, co-teaching, differentiation
	Cluster of LBD Field Practicum Courses	
ECE 575A LBD Field Component I Part A	Taken as soon as possible. Prerequi-sites: ECE 501 and/or ECE 502	Initial field experience, 15+ hours local mentoring, 60 field contact hours minimum, explicit teaching, lesson planning

Table 3.7 (continued)

ECE 575B LBD Field Component I Part B	Taken in first 20 hours Prerequisites: ECE 501-502, 575A	Second field experience, 15+ hours local mentoring, 60 field contact hours minimum, lesson planning and follow-up, professional growth plan, assistive technology experiences
20 hours	*Checkpoint 2*	*After passing at least one Praxis test and ECE 500-504 and 575A-B, the candidate can progress to other courses in the curriculum (total of 36-39 hours) as well as ECE 576*
ECE 576 LBD Field Component II	Prerequisites: Checkpoint 2	Final clinical practice, 30+ hours of local mentoring, LBD teaching position or on approval in current school or full-time student teaching
	Cluster of General Education Methods Courses	
EDU 501 Reading Methods		Foundations of reading, diagnostic reading assessment, reading strategies, methods for struggling readers
EDU 509 Math Methods		Methods of teaching math core skills K-8
EDU 542 Education Technology		Instructional and assistive technologies

As noted in Table 3.7, Checkpoint 2 represents part of the continuous assessment procedures required for program accreditation. In addition to the curriculum, candidates must take and pass at least one LBD Praxis test, usually the #0353 Praxis test, by the time they have earned 20 hours in the program, although this requirement was not consistently monitored until fall 2010. Although this was a system error, it provides the opportunity to study the effect of the range of hours and course sequence. The second Praxis test, usually #0542, is not required until program completion though candidates are encouraged to take it earlier. Consequently, within some broad parameters, candidates experience some differences in curriculum sequence or pattern of preparation, as well as the number of earned hours prior to taking either LBD Praxis test. If the data suggest that a particular pattern of preparation is associated with stronger candidate knowledge, either individually or in combination with the candidate's prior background and field context, then recommendations for the program sequence can be made. The following are the operational definitions for the program sequence variables.

Cumulative earned hours. This is the total number of hours completed in the LBD program. For the study, the earned hours of interest were those successfully completed prior to the time that the candidate took the test, categorized as Successful, meaning completed with a grade of A or B, or Unsuccessful, meaning not completed or completed but receiving a grade of C or lower. Cumulative Hours for #0353 Praxis and Cumulative Hours for #0542 Praxis are two separate variables, both of which are interval and can range from 0 to 39 (i.e., maximum total program hours). If the data were to suggest that candidates' performance on either test is higher after a particular number of earned hours, then a recommendation would be made for adjustment of the LBD continuous assessment plan for the timing when students must take the Praxis tests.

Successful courses. This is a dichotomous variable for each Exceptional Child Education course (ECE 500-504), each LBD field course (ECE 575A, 575B, 576), and each Education Methods course (EDU 501, 509, 542), numerically categorized as successful, meaning completed with a grade of A or B, or unsuccessful, meaning not completed or receiving a grade of C or lower. Because candidates choose when to take the tests, there is some variability in the specific courses completed prior to each test, particularly for candidates taking the tests early in their program and for candidates taking the tests much later due to inconsistent program monitoring of progress. Prior to 2010, tracking of when candidates took their initial Praxis test was inconsistent. Although this was a system error, it provides the opportunity to study the effect of the range of hours and course sequence. Certified teachers who had already taken any of the general methods courses prior to the LBD program were credited with successfully completing these courses because the knowledge acquired earlier cannot be unlearned. In addition to a score of either 1 (i.e., successfully taken) or 0 (i.e., unsuccessful or not taken) for each course, the scores can be summed by cluster to create the three variables of ECE core courses, LBD field courses and EDU methods courses to determine if any particular cluster has an impact. If there is a particular impact, then program adjustments in sequence can be made.

Ethnicity and gender. As standard procedure, the candidate's gender and ethnicity were included as dichotomous variables, as male-female and white-other, respectively. In the ABC program, most candidates from a diverse background are African American, with too few to report separately from Hispanic, Native American and Asian backgrounds. Should there be differences by gender or ethnicity, the program would need to consider supports to diversify a work force which has traditionally been white middle-

class women, to become more like the changing demographics of the K-12 student population.

Program Constants

Despite the variability in candidate pre-program preparation, field context, and program sequence, there is currently a common program core which controls or holds constant other conditions related to program features, people and settings. As described previously, candidates complete the same courses with the exception of the two research methods courses taken in place of reading and math methods by certified teachers who have already completed the methods courses. Although the ECE courses have undergone modifications and improvements that normally occur between semesters in response to candidate performance and other input, the LBD program faculty has been stable over time, with the same person teaching each course during different semesters. Minor changes have occurred in the field courses where faculty occasionally rotate courses, but the content, textbooks and assignments have been common across faculty. Features that have remained constant include field class assignments, such as lesson plans and observation forms, as well as local mentoring expectations and the college field supervisors who provide individual distance and onsite support. An agreement is made with each local mentor for specific coaching activities, including candidate observations and feedback, for which the mentor is paid a small stipend. Although full-time faculty provide field supervision for some candidates, much of the field work is conducted by an average of 12 college supervisors who are active or recently retired special educators, most with administrative experience in special education as well as classroom teaching. All but two of these college field supervisors have been with the program throughout the time under study. Although formal reliability measures on lesson observations across

college field supervisors have not be taken, annual training and updates occur, with faculty and field supervisors working together as a team four times a year, twice per semester.

Data Preparation

ABC College, through its administration and Institutional Research Board, approved use of archival LBD program data for the statistical study (Appendix D). At the College level, these data are maintained in Jenzabar® software which is designed for institutions of higher education and can be downloaded into ExCel® format. In addition, some program data are maintained independently by the LBD program in ExCel® format for functional applications specific to the program for monitoring candidate progress. All records are maintained by College student identification codes, cross-listed with student name. An independent candidate identification code list was created for all of the participants in the statistical study, as described previously. Individual candidate records were then identified by this new code to assure protection of personally identifiable information. The individual data required for the study (i.e., the dependent and independent variables) were combined into one large ExCel® file. As part of the preparation, data for dichotomous variables were numerically coded, and the data set "cleaned" for missing data. Although some descriptive statistics could be computed directly from ExCel®, the data set was loaded for analysis into a statistical package that is available at the College (i.e., Minitab® Statistical Software).

The data for the statistical study was maintained and manipulated on an ABC file server in a folder set up for access limited to the researcher and shared only with faculty members serving as consultants on the statistical analysis. After the study has been completed, if the analytical procedures have been shown to be useful to ABC College, the

data will be maintained on the secured ABC file server for a period of 5 years to allow periodic updates and analysis by ABC College for program evaluation purposes. Otherwise, the study data will be deleted, using standard security procedures.

Descriptive Statistics of the Variables

Prior to conducting the analysis for Research Questions 1 and 2, descriptive statistics on all variables were completed. As described in Chapter Four, Results, descriptive statistics address shapes, center and spreads for all interval measures. These include the ABC LBD mean, median, standard deviation, distribution shape and spread for #0353 Praxis and #0542 Praxis overall scores, as well as all subtest category scores; the undergraduate GPA, cumulative hours taken before each test, and totals of courses taken by cluster prior to each test. In particular, bivariate normal distribution of the scores was checked to verify the assumption of homoscedasticity of the dependent variables because an equal spread of scores was needed for later analysis. Given the sample size and the score distributions approximating normal, statistical adjustments were not needed prior to the later analyses. For the dichotomous variables, frequency counts were computed.

Inferential statistics were computed to determine whether the two overall test scores co-vary as well as whether the test category scores are correlated to the overall score. The Pearson-product moment correlation coefficient r was used to determine the degree and the direction of the relationship between these variables. Although both tests address candidate content knowledge of special education and teaching practices, the tests are not assumed to have a perfect correlation because they have different response formats, somewhat different content and emphases, and may be taken at different points in the program. Because they are not repeated measures, the test statistic t for paired

scores was not used. The statistical analysis to determine co-variance is based on hypothesis testing. In this approach, the null hypothesis states that there is no correlation between the two dependent variables. The alternative hypothesis is that there is a positive correlation (i.e., that the level of knowledge measured by the two tests co-varies, with higher scores on one correlated to higher scores on the other, shown through the > sign). This can be written as follows, where x is #0353 Praxis and y is #0542 Praxis and r is the correlation coefficient between x and y:

Null hypothesis: H_0: $r_{xy} = 0$

Alternative hypothesis: H_A: $r_{xy} > 0$

Using the statistical package, the correlational coefficient r was computed for the degree and direction of the relationship. The square of the correlation r^2 (i.e., coefficient of determination) describes the proportion of the variance predicted in one test from the other, or predicted in one test from its individual category scores. If they are perfectly correlated (i.e., $r_{xy} = 1$), then one can be predicted from the other. An α-level of significance was set at .05, the statistical significance of the difference, meaning that the difference would be greater than expected by chance (i.e., probability p of observing that the scores were as different by chance as what was observed and the confidence interval for the degree of precision in the co-variance estimate). All descriptive statistics are presented in Chapter Four, Results.

Analytical Procedures for Research Question 1

Research Question 1 used a simple linear regression model to examine the candidate's knowledge in relation to the background prior to the program and/or the context in which the candidate completes field experiences. In the simple model, only two possible variables are considered, background and field context. A different way of

stating this is to determine whether a candidate's Praxis score on either test can be predicted from the candidate's background and/or field context. For each Praxis test, a model was fitted to determine which independent variables predicted the Praxis outcomes. Hypotheses were tested to determine whether one, two or no independent variables were related to the Praxis scores. The simple model is:

$$Y_1 = b_0 + b_1*\text{background} + b_2*\text{field context}$$

The general statistical method used to predict either test score #0353 or #0542 from two or more independent variables (i.e., background and field context) was regression. Both background and field context were entered as dummy variables in the multiple regression model. Dummy variables are those which are assigned a numerical number of 0 or 1 to indicate the absence or presence of a categorical effect (i.e., 1 indicates prior education background or already certified while 0 indicates no prior education background; 1 indicates teaching LBD while 0 indicates not teaching, or traditional field experiences0. In the analysis, four correlation coefficients were computed:

Level of knowledge on #0353 Praxis and: (1) background;

(2) field context;

Level of knowledge on #0542 Praxis and: (3) background;

(4) field context.

The simple regression equation used a linear model to predict each test score from the independent variables. An α-level of significance was set at.05, and a different *t*-test was used to assess the significance of the regression coefficients because the independent variables of background and field context are dichotomous, not continuous. In this case, if *p* were less than .05, the null hypothesis was rejected in favor of the alternative that

there is a correlation between the candidate's Praxis test score and, as applicable, the candidate's background or field context.

An analysis was conducted of the relationship between a candidate's background and the candidate's context for field experience (e.g., whether a candidate with prior preparation in education is more likely to be employed as an LBD teacher). These two factors may interact with each other, leading to interaction effects which can be added to the model. This procedure is designed to determine if there is a background-by-field context interaction, whether or not there is a main effect for either background or context for field experiences.

Analytical Procedures for Research Question 2

Research Question 2 is for a more elaborate model and examines how well the two main variables (i.e., candidate background and context for field experience) explain the candidate's levels of knowledge in special education and teaching practices and whether there are other factors that predict a candidate's test scores. Consequently, it relies on results from Question 1 analysis but considers alternatives, such as the candidate's background-field context cell at the time of taking the test, undergraduate GPA as a facsimile for overall academic performance and commitment, as well as the candidate's sequence or pattern of preparation, measured by the candidate's cumulative earned hours and successful completion of clusters of program courses at the time of first taking the applicable Praxis test. A multiple regression procedure for each Praxis test was used to determine the explanatory power of the different variables, with the order of the introduction of the independent variables based on investigator selection. Through this process, the impact of background, field context, and the other variables was parsed.

Analysis for Question 2 represents incrementing the model used in Question 1 and determining whether adding variables increases the predictive power of the model.

Procedures for the Qualitative Study

Design

Candidates' perceptions about their knowledge and how they acquired this knowledge are addressed in Research Question 3. Although it would have been possible to attempt to survey all participants in the statistical study, qualitative data was collected from participants through open-ended questions in a focus group interview format designed to identify exploratory themes as well as social validity for recommendations (Frey & Fontana, 1991; Krueger, 2002; Vaughn, Schumm, & Sinegub, 1996). The focus group format is considered a useful method for identifying issues and themes where there is little exiting research, and the small group process can serve as a springboard for more insights than individual interviews or surveys (Boardman, Arguelles, Vaughn, Hughes, & Klingner, 2005; Frey & Fontana, 1991). For this exploratory purpose, the focus group interviews followed the preliminary analysis of the data for Research Questions 1 and 2. The goals for the focus groups were to: (1) develop a general understanding of what content and pedagogical knowledge participants perceive as important to their role as a special educators; (2) identify sources of knowledge that participants perceive as most important, particularly as related to topics addressed in the two LBD Praxis tests; and (3) provide direction for program improvement recommendations.

Although most focus groups are conducted in face-to-face small groups (Vaughn, Schumm, & Sinagub, 1996), candidates and graduates of the online ABC College LBD program are located across the state, and thus a distance education format was used (i.e., desktop audio conferencing). Desktop audio conferencing is used regularly for business

meetings and as one form of delivery for online programs. In a desktop audio conference, a host or organizer provides a web link that participants access through the Internet; all conversation is heard; and the organizer's desktop computer screen is visible, which may consist of slides, written documents, web links, or anything else that can be viewed on a computer screen.

Focus Group Participants

For participants in the focus groups for Question 3, a sampling of each of the four groups of candidates identified in Table 3.1 by background and field context was used. Four focus groups were created, one for each of the following cells: (1) already certified teachers who are teaching LBD on a temporary provisional certificate, (2) already certified teachers who extending their credentials through traditional practicum experiences; (3) alternate route LBD teachers who are new to education, and (4) traditional field experience candidates without a previous education background. As recommended for focus group interviews, each group was planned to include five to six individuals, balanced across geographic locations and status (i.e., graduates and current enrollees) for a total of 20-24 interviewees (Krueger, 2002; Morgan & Krueger, 1993). Where possible, each group included include at least one candidate who did not pass the content and/or pedagogical knowledge test the first time it was taken in order to include interviewees across the range of outcome measures. The intention of the focus group was to generate as much insight as possible on the topic, not to reach consensus (Krueger, 1998). Therefore, it was desirable to have as much variety within the group as possible, while keeping the group homogeneous by the variable of interest.

Contacts for all focus group participants were made by a coordinator who was not affiliated with the LBD program. The purpose of a neutral contact person is to assure

voluntary participation and confidentiality of individual comments, and avoid any appearance of coercion to participate. A pool of suggested interviewees was identified through ABC LBD program faculty. However, the contact coordinator received the complete listing of study participants by identification code, demographic data and code for the cell. The coordinator also had access to the ABC database with email and phone contact information for the study participants. From the study pool, the coordinator selected 10 participants from each group for contact, allowing for as much diversity as possible within each group. Individual contacts to potential participants were made via email and phone. Two of the focus groups were held as planned. However, a problem arose in scheduling the focus group sessions due to the timing of the study, with lower than planned acceptance. A number of the individuals selected by the contact coordinator indicated that they were very willing to participate but not on the scheduled dates. Consequently, individual phone interviews were conducted for the two other groups instead.

Participant Consent

For those individuals who responded to the initial email and phone contact, formal invitation letters to the desktop audio conference were sent, along with the consent form. A copy of the recruitment email, the consent form and instructions are in Appendix E. In order to participate in the focus group, interviewees were required to return the signed consent form in advance of the scheduled time. Information for accessing the desktop audio conference link was sent electronically, and interviewees attended the focus group via the web-based link provided. Consent was also obtained for those individuals who participated via phone interview instead of focus group session.

Group Moderator

An experienced group moderator/facilitator with general knowledge of special education was identified to conduct the focus groups. Moderator skills for focus groups included the ability to: (a) create a warm and friendly atmosphere, (b) set ground rules for the session, (c) use open-ended questions with mild, unobtrusive control, (d) encourage responses from all participants, and (e) summarize key thoughts. Prior to the focus group sessions, the moderator was trained in areas to pursue from the participant responses. An assistant not affiliated with the program was present to handle the technical aspects of the session, including activating the audio recording component of the video conferencing software. In order to maintain the confidentiality, transcripts of the desktop audio conferencing sessions were prepared by an external person, with speaker names omitted. The moderator/facilitator also conducted all phone interviews and prepared complete notes of interviewee responses.

Perceptions of Knowledge

Themes that were explored in the focus groups are summarized in Table 3.8. Each focus group interview began with a welcome by the moderator (group facilitator), a review of the purpose of the group interview, and discussion ground rules, including the desire for variability in responding rather than expecting consensus, and the neutral role of the moderator (Krueger, 1998). In focus groups, general questions moved to more specific ones, and the moderator had some flexibility in the wording of questions and follow-ups to explore the topics identified by the researcher and to follow the thoughts of the participants (Vaughn, Schumm, & Sinagub, 1996). At the end of the session, the moderator summarized key points, and then asked for verification from participants about what was said before thanking the group and closing the session. Participants were

assured that all notes from the session would be anonymous; the archived records would be destroyed after use; and no personally identifying information would be shared. A guide was prepared for the focus group moderator to assure fidelity in the implementation of the focus group process, and is found in Appendix G. For phone interviews, a similar sequence was followed.

Table 3.8, Purpose of Focus Group Questions and Relation to the Literature

Question Categories and Themes	Purpose	Relation to Literature
Opening		
1. Tell us where you teach.	Introduce participants to each other	Krueger, 1998; Vaughn, Schumm, & Sinagub, 1996.
Introductory/Warm-Up Question		
2. What led you to pursue being an LBD teacher?	Transition to the topic Candidate frame of reference	Krueger, 1998; Vaughn, Schumm, & Sinagub, 1996;
3. What do you believe you need to know to begin as an LBD teacher? Follow-up #1: Are any of (these) most important as you started in LBD? Follow-up #2: How well-prepared do you feel for being an LBD teacher? *Follow-up #3: What did you need to know that was different or in addition to your original training?	Candidate perception of knowledge needed Visual prompt of broad categories aligned to Praxis: assessment, curriculum/instruction, learning environment, disabilities and learner needs, due process/legal procedures, other For already-certified candidates in groups 1 and 2	Kagan, 1992

Table 3.8 (continued)

4. How did you gain your knowledge about special education and LBD teaching practices? Follow-up: Were any of these sources most important to you?	Candidate perception of how they learned to teach Visual prompt of broad categories: coursework (special, general), field experience, mentor, personal reflection, other	Alexander, Muir, & Chant, 1992; Carter, 1990; Bramald, Hardman, & Leat, 1995
5. How did your knowledge about these areas change during the program? Table 3.8 (continued) Follow-up: How confident do you feel in applying this knowledge in the classroom?	Candidate perception of their professional growth during the program	Kagan, 1992
6. How well did the LBD Praxis testing capture and reflect your knowledge about special education and LBD?	Candidate perception of the construct validity of the LBD Praxis test	D'Agnostino & VanWinkle, 2007; Sutton, 2010
7. Are there any suggestions that you have for the LBD program to help you learn or acquire this knowledge better?	Social validity for recommendations	
Closing		
8. (Summarize) Does this capture your thinking?	Candidate confirmation	Krueger, 2002; Vaughn, Schumm, & Sinagub, 1996.

Pilot Process

Although the series of questions outlined in Table 3.8 are a frame for the discussion, the focus group interviews were designed to follow the preliminary analysis

of the data for Research Questions 1 and 2. Based on the preliminary analysis, the focus questions did not need to be adjusted to explore relationships found between candidate level of professional knowledge and the independent variables. Interview questions and the focus group process were piloted before formal use. Select faculty at ABC reviewed the questions for input, and the facilitator was trained on the purpose of the questions and the areas to explore. Six volunteers were invited to a pilot focus group to practice the desktop audio conferencing technology and the structure provided in the Focus Group Moderator Guide, as well as to preview the questions to assure that they promoted rich discussion in the areas of interest. The pilot was conducted successfully with three participants.

Desktop Audio Conferencing Technology

ABC College has a license for desktop audio conferencing through GoToMeeting®, and the LBD program uses this software in some courses and for special purpose trainings and meetings as part of distance education delivery. Other than a computer and Internet connections, participants only need a headset for better audio, and most current candidates and recent graduates have some experience with GoToMeeting® or comparable software. Interviewees were offered reimbursement for purchasing a headset, if needed; however, no participants requested this. Given the size of the focus groups, an open mike format could be used rather than more formal procedures required in large group settings to address background noise and audio issues, although if there were sound problems the moderator/facilitator had the option to to open microphones individually. The archived record included both the audio and the desktop screen as it occurred in real time, and was transcribed after the session.

Analytical Procedures for Research Question 3

From the transcribed records, the investigator prepared an outline and notes for each group separately, which were shared with the facilitator first. After edits were made, the revision was emailed through the contact coordinator to the participants for accuracy. Since the intent was not to develop consensus or statistically analyze the data, the final notes with any additions or editing by the facilitator or participants were used for analysis. The investigator analyzed the notes for any differences between the groups, either in emphases or in opposing viewpoints. After any differences were identified, the comments were grouped by adding categories, themes and subthemes and shared with the facilitator and LBD faculty for initial interpretation of results and validity toward recommendations. The themes that emerged from the data and any differences between groups are reported in Chapter Four, Results.

Chapter Four

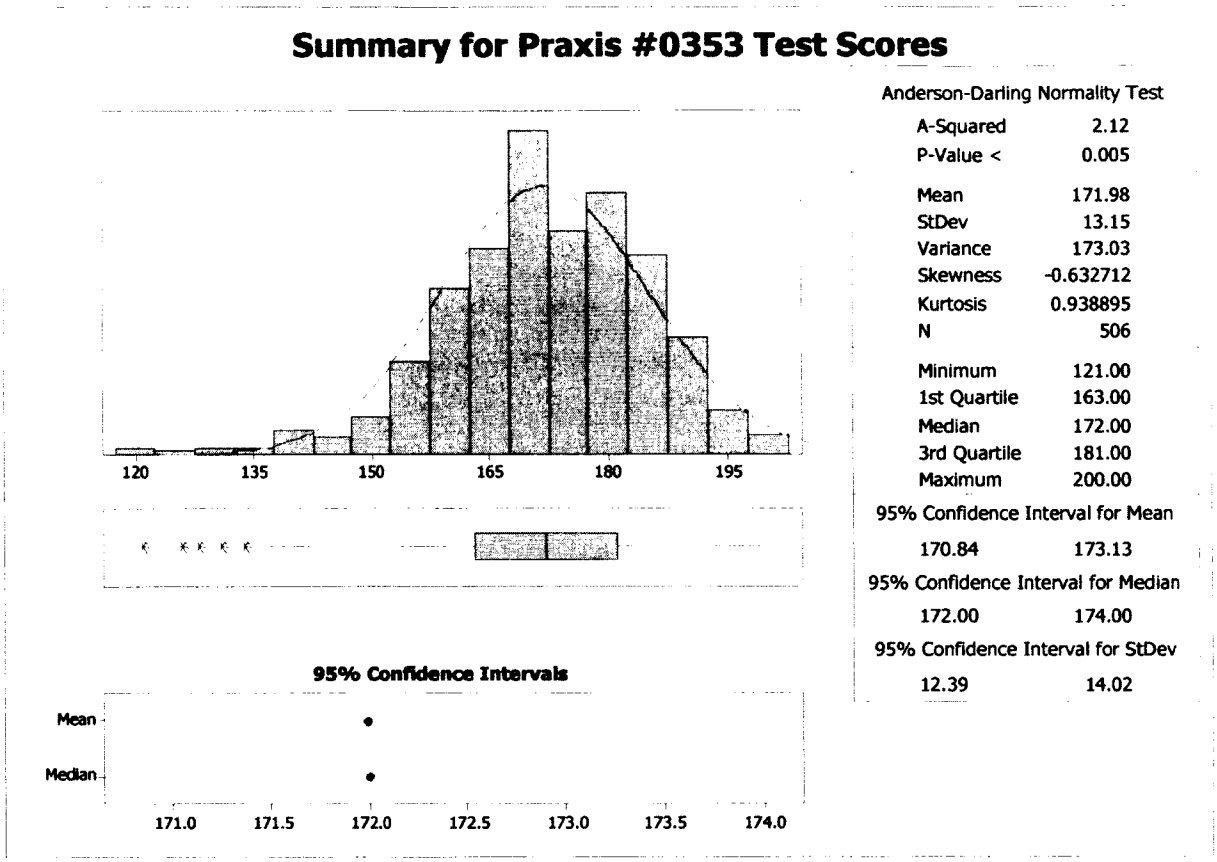
Results

Descriptive Statistics: Dependent Variables

Praxis #0353 Multiple Choice Test Scores

As can be seen in Figure 4.1, the ABC scores for the Praxis #0353 multiple-choice test approximate a normal distribution (n = 506), with the mean and median almost identical (171.98 and 172.00 respectively) and above the state passing score of 157. In an independent samples *t*-test for equality of means of the national ETS sample (172.3) and ABC scores (172.0), equal variances are assumed and there is no statistical difference between the two groups ($p = 0.613$, T-value = 0.51). The ABC distribution is slightly skewed toward higher scores, with a few outliers at the lower end, as seen in the boxplot in the center of Figure 4.1. An analysis of the five outliers indicates that all five are scores of candidates new to the field, with 80% acquiring LBD field experiences in traditional settings (i.e., Cell 4 New-Traditional). The scores are primarily from women (80%) and represent a disproportionate number of candidates from diverse backgrounds (60%). Analysis of the three subtest scores (i.e., Exceptionalities, Legal Issues and Service Delivery) shows each strongly correlated with the overall test score (r from 0.579 to 0.794; $p = 0.000$), with amount of the success on a particular subtest predicting the overall score following the approximate percentage of overall test items that relate to the subtest area. Subtest scores approximate normal distributions and are significantly correlated with each other ($p \leq .021$), but have limited value in predicting one subtest score from another ($r \leq 0.368$). More complete statistical information on Praxis #0353 scores is found in Appendix H.

Figure 4.1, Descriptive statistics for participant scores on the Praxis Test #0353.

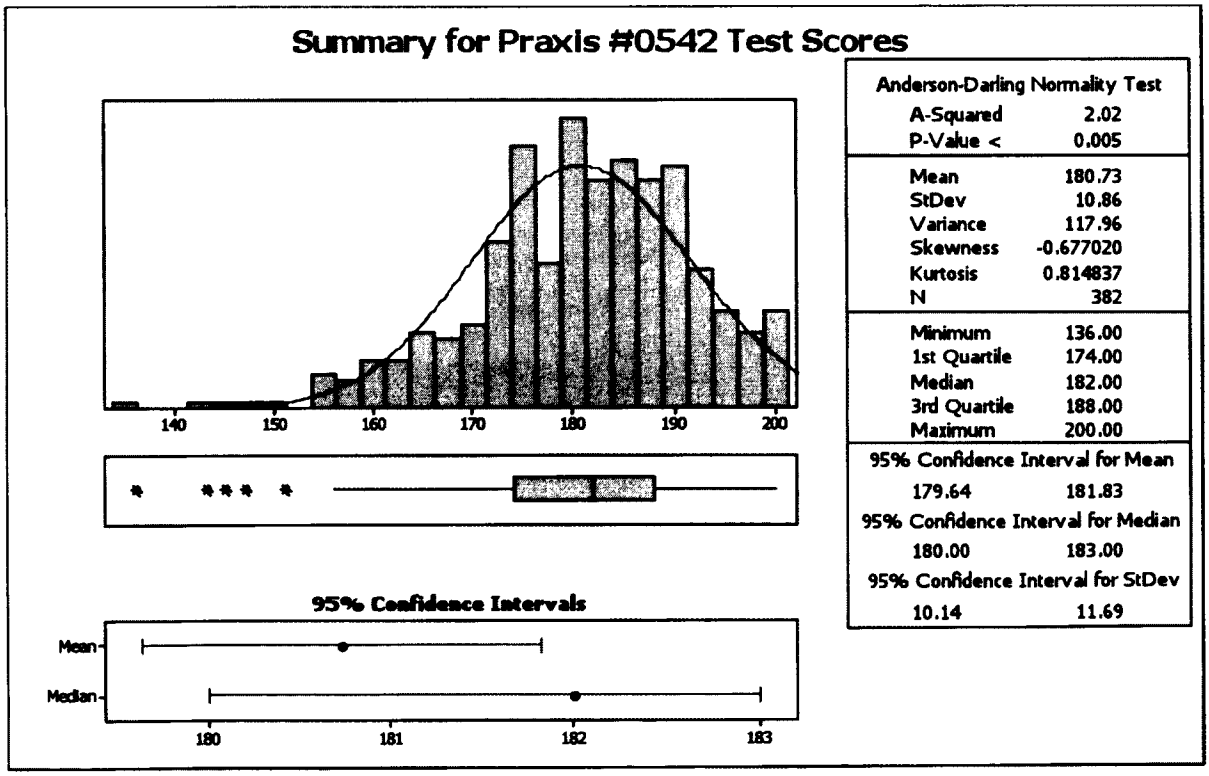


Praxis #0542 Scenario Test Scores

Figure 4.2 provides statistical information on ABC scores for the Praxis scenario test #0542 (n = 382), which again approximate a normal distribution. However, the median is somewhat greater than the mean (182.00 and 180.73, respectively), indicating a skew toward lower scores on the scenario test where the average is lower due to a few low scores noted as outliers in Figure 4.2. In an independent samples *t*-test for equality of the ABC mean (182.00) and the ETS national mean (177.2), the two means are significantly different, with ABC's mean estimated as 6.14 points higher ($p = 0.000$; *T*-value = 6.14). Of the five outliers in the low end of scores, again all are from candidates new to the field, but mixed as to the field setting for experiences: 60% are from Cell 3 new-to-education LBD teachers and 40% from Cell 4 initial candidates in traditional field

settings. Compared to the Praxis #0353 outliers, only 60% are female, and only one (10%) from a diverse background. The three subtest scores (i.e., Assessment, Curriculum and Instruction, and Learning Environment) have less normal distribution with means higher than medians. This small skew indicates that there are more frequent lower scores, and that the mean is raised by a few higher scores. It should be noted that each subtest score represents only 1 or 2 scenario items on the test. While the three subtest scores are significantly correlated to the overall Praxis #0542 score ($p = 0.000$), the values of predicting the overall score from the subtest score are generally lower than for the Praxis #0353 subtest scores (r ranges from 0.4896 to 0.6310). The Learning Environments subtest score has the least predictive value ($r = 0.498$), and there is no significant correlation among the subtest scores. Appendix I provides more statistical information on Praxis #0542 scores.

Figure 4.2, Descriptive statistics for participant scores on the Praxis Test #0542.

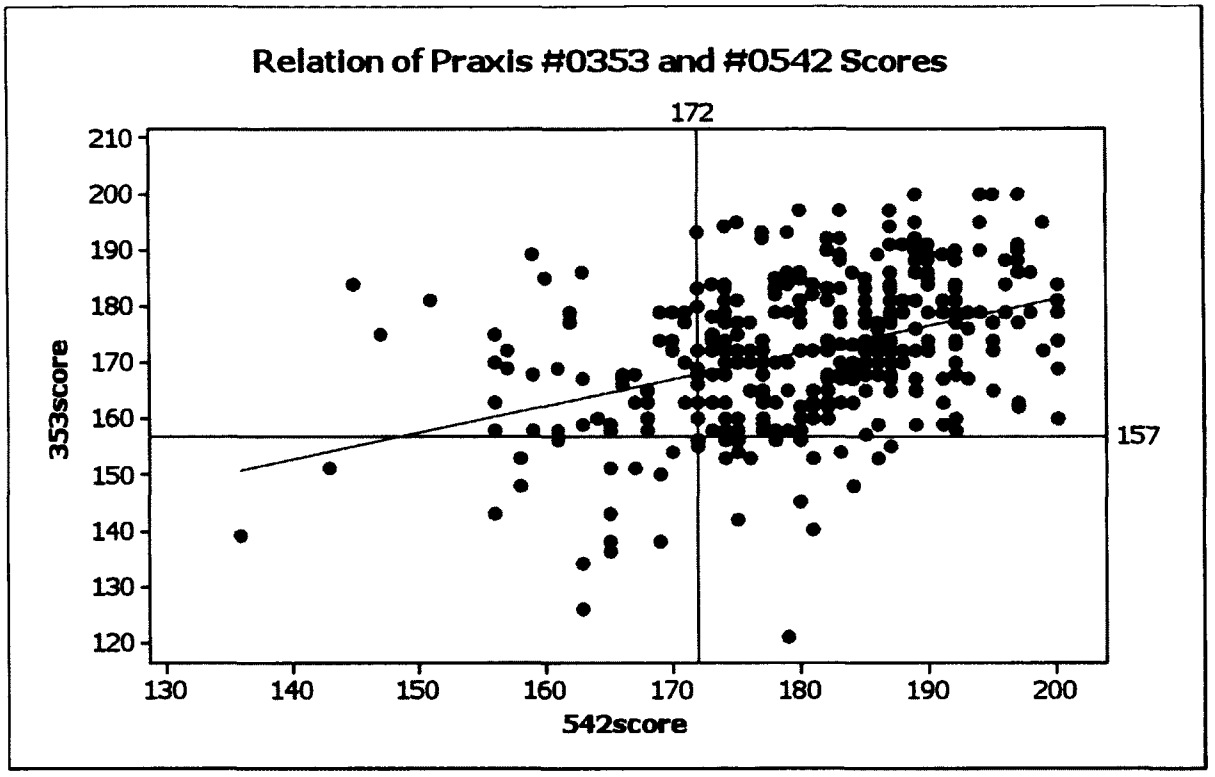


Correlation of Praxis Test #0353 Scores and Praxis Test #0542 Scores

Although the two Praxis tests both address knowledge determined to be important for licensure purposes of beginning special educators, the test format and content vary between the two, and ABC candidates may take these at two separate times, usually beginning with the Praxis #0353 multiple choice test. Figure 4.3 is a scatterplot with a regression line showing the relationship between a candidate's two initial test scores. While the two scores are positively related, the correlation is only moderate ($p = 0.000$, $r = 0.405$), meaning that about 16% of the variation is explained and they cannot be predicted well from one to the other. Figure 4.3 delineates the passing scores for each test, and the top right cell where participants who passed both tests the first time is well-represented. However, there are multiple instances of individuals who scored well on the first attempt of one test but not the other (i.e., top left and bottom right cells) and of individuals who failed both tests the first time (i.e., bottom left cel)l. In a review of the 15 participants who failed both tests on the first attempt, all are new to education, roughly balanced between those teaching LBD (i.e., 7 in Cell 3) and those who acquired field experiences through traditional placements (i.e., 8 in Cell 4). A disproportionate number (33%) are from diverse backgrounds.

In summary, descriptive statistics on the dependent variables of the test scores indicate that scores approximate a normal distribution, and ABC candidates on the average perform as well as or better than the ETS national sample on the two Praxis tests required for LBD certification. While the two scores of participants have a positive relationship with each other, scores on one test do not have a strong value in predicting the other score. Finally, the individual subtest scores are positively related to the overall

Figure 4.3, Relation of Praxis #0353 and #0542 scores.



score, which appears to be an extension of information publicly available in the ETS Praxis II manuals. However, the subtest scores have minimal correlation with each other.

Descriptive Statistics: Independent Variables

Pre-Program Background and Field Context for LBD Experiences

Statistical study participants. In Chapter III Table 3.4, participants are reported as either graduates or those who have not yet graduated, according to four demographic characteristics: (1) background prior to the program as an already certified teacher who is extending an existing certificate (i.e., "Certified") or as new to the field (i.e., "New"); (2) gender; (3) ethnicity; and (4) field status at the time of graduation or, for those not yet graduated, at the time of the collection of data for this study, either teaching on a Temporary Provisional LBD certificate (i.e., "LBD"), or completing field experiences as a traditional student (i.e., "Traditional"). Table 3.4 provides tallies of the numbers in each

group, and as reported in Chapter 3, graduates are more likely to be teaching LBD on a Temporary Provisional certificate than those not yet completing, and there are more men who have not yet graduated than in the groups who have already graduated.

Background-LBD field context cells for Praxis #0353. In addition to examining the participants by graduation status, a useful analysis is to review the same demographic data by the four cells which represent the interaction between prior preparation background and field context for LBD experiences in the program. All 506 participants in the study have taken the Praxis multiple choice test #0353 on core knowledge in special education. Table 4.1 provides the demographic information for all study participants, separated by the cells identified in Table 3.1, according to pre-program background (i.e., certified or new) and their field status for their LBD experiences (i.e., teaching LBD on a temporary provisional certificate or traditional graduate practicum experiences). Because candidates may change employment status during the program, participants are reported in Table 4.1 by their LBD teaching status at the time they first took Praxis #0353, which represents what classroom experiences in LBD they would have had at the time of testing. This may be a different field context status than is reported in Table 3.2 where graduates are reported by their LBD teaching status at the time of graduation, and in Tables 3.3 and 3.4, where other participants in the study are reported by their LBD teaching status at the time of the cut-off date for the study.

In Table 4.1, Cells 1 and 2 show already certified teachers who are developing their LBD skills as either an LBD teacher (i.e., Cell 1) or in a traditional practicum setting (i.e., Cell 2), with numbers and percentage of a group within the cell total reported. Although there is a difference between the two cells of already certified teachers regarding the percentage of men (i.e., a greater percentage of the certified

Table 4.1, Statistical Study Participants by Cell for Test #0353

Background		Field Context		Gender **		Ethnicity *	
Already Certified	New	LBD Teacher	Traditional	M	F	White	Other
Cell 1: Already Certified, Teaching LBD (n = 47)							
47	0	47	0	14	33	44	3
	0%		0%		70.2%		6.4%
Cell 2: Already Certified, Traditional Field Experience (n = 99)							
99	0	0	99	14	85	95	4
	0%		100%		85.9%		4.0%
Cell 3: Initial Certificate, Teaching LBD (n = 162)							
0	162	162	0	68	94	136	26
	100%		0%		58.0%		16.0%
Cell 4: Initial Certificate, Traditional Field Experience (n = 198)							
0	198	0	198	47	151	175	23
	100%		100%		72.3%		11.6%
Total *(n = 506)*							
146	360	209	297		363	450	56
	71.1%		58.7%	43	71.7%		11.1%

* $p < 0.05$ ** $p < 0.01$

teachers employed as LBD teachers are men), the percentage of individuals from diverse backgrounds is very similar and at low level (i.e., 4-6.4%); these data in Cells 1 and 2 appear similar to the perception of teachers as predominantly white and female. Participant demographics in Cell 3, representing individuals new to education who are LBD teachers on an LBD temporary provisional, are different from Cells 1 and 2 in both gender and diversity, with 42.0% men and 16.0% ethnic diversity. While the individuals in Cell 4 (i.e., new to education, but not teaching LBD) are more similar to Cell 3 in gender and diversity, the differences with Cells 1 and 2 are not quite as dramatic. These

differences between the cells for participants taking Praxis #0353 are statistically significant for gender (1, 506; p= 0.000; *chi square* = 26.816) and ethnicity (1, 506; p = 0.017; *chi square* = 10.161). Consequently, gender and diversity are considered separately in the analysis of factors potentially affecting Praxis #0353 scores, along with the participant's pre-program background, field context for LBD experiences, and the cross variable of background-field cell.

Background-LBD field context cell for Praxis #0542. Candidates may take the constructed-response, scenario test #0542 at the same time as the multiple-choice test #0353 or later, and may occasionally take the tests in reverse order. Consequently, Table 4.2 reports the demographic information on participants separately for test #0542. The total number of all study participants who took the Praxis #0542 test is 382, or 75.5% of the total study participants. Those participants who did not take the #0542 test were either: (1) 2008 graduates who took the different Praxis test that had been required prior to 2007 in Kentucky; or (2) candidates who have not yet completed the LBD program, including taking and passing test #0542. The different demographic patterns of participants seen in Table 4.1 continue to be statistically significant in ethnicity (1, 382; p = 0.017; *chi square* = 10.256) and gender (1, 382; p = 0.001; *chi square* = 17.488). These differences between cells, with the participants who are new to education and teaching LBD (i.e., Cell 3) being significantly more diverse and male, and the other participants new to education but in a traditional field context for their learning (i.e., Cell 4) also more diverse. Based on these data, gender and diversity were considered separately in the analysis of factors potentially affecting Praxis #0542 scores, along with the participant's pre-program background, field context for LBD experiences, and the cross variable of background-field cell.

Table 4.2 Statistical Study Participants by Cell for Test #0542

Background		Field Context		Gender **		Ethnicity *	
Already Certified	New	LBD Teacher	Traditional	M	F	White	Other
Cell 1: Already Certified, Teaching LBD (n = 43)							
43	0	43	0	12	31	40	4
	0%		0%		72.1%		9.3%
Cell 2: Already Certified, Traditional Field Experience (n = 67)							
67	0	0	67	7	60	63	4
	0%		100%		89.6%		6.0%
Cell 3: Initial Certificate, Teaching LBD (n = 148)							
0	148	148	0	54	94	119	29
	100%		0%		63.5%		19.6%
Cell 4: Initial Certificate, Traditional Field Experience (n = 124)							
0	124	0	124	28	96	110	14
	100%		100%		77.4%		11.3%
Total (n = 382)							
110	272	191	191	101	281	332	50
	71.2%		50.0%		73.6%		13.1%

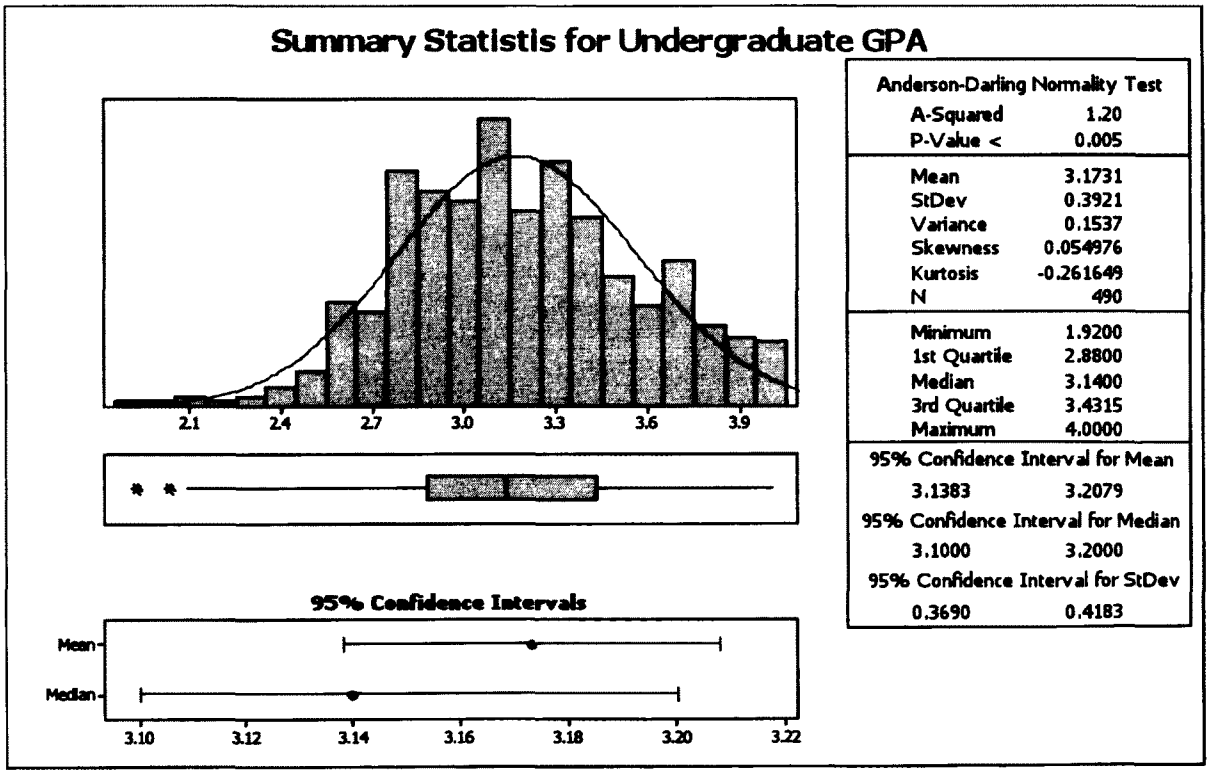
* $p < 0.05$ ** $p < 0.01$

Participant Undergraduate GPA's

As described in Figure 4.4, the undergraduate GPA's for individuals in the ABC program approach a normal distribution, with the mean and median almost identical and slightly above a B average (3.1731 and 3.1400, respectively). There are two outliers with GPA's below 2.0, indicating that the two individuals completed their undergraduate

degrees at institutions where there was some provision for students to graduate with lower than a C average. The ABC graduate admissions requirement is a GPA of 2.75 or higher, and 60 participants in the study with GPA's lower than 2.75 were admitted to ABC through alternative criteria (i.e., GRE passing scores, graduate GPA of 3.0 or higher, or review of the last 60 hours of the undergraduate transcript). Given a few missing undergraduate GPA scores in the data base, the result is that 12.2% of LBD participants (60 out of 490) had undergraduate achievement below minimum graduate expectations when they entered the program. However, in relation to Figure 4.3 which shows the correlation between the scores of the two Praxis tests, 20% of the participants who failed both tests on the first attempt (i.e., 3 out of 15) had undergraduate GPA's under 2.75.

Figure 4.4. Descriptive statistics for undergraduate GPA



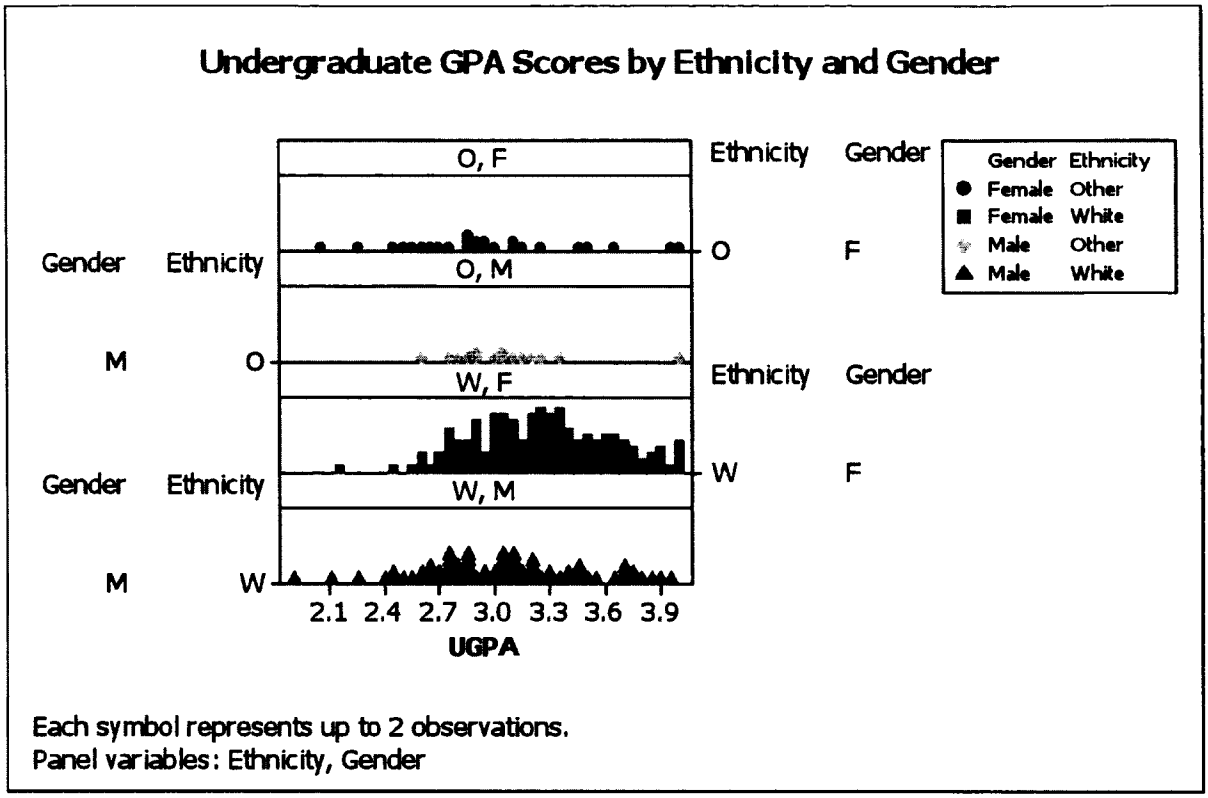
In a review of the undergraduate GPA's, there is no statistical difference across the graduation years in the study or with the others not yet graduated. However, there is a statistically significant difference between the undergraduate GPA's of participants across the background-field context cells, with Cell 3 New to education/LBD teachers having the lowest GPA's and Cell 4 next lowest, New to education/Traditional field experiences. This difference is small but occurs for both these cells for the multiple choice test #0353 ($p = 0.000$, $F = 8.33$) and the cells for the scenario test ($p = 0.001$, $F = 5.32$).

Because of the differences between cells in gender and diversity, it was important to review the impact of these factors on GPA as a facsimile for achievement. Figure 4.5 provides a visual of the distribution of undergraduate GPA's by both gender and ethnicity. Each group shows a distribution across the range, and those with GPA's below 2.75 are represented in each group, suggesting that the alternative criteria are important for increasing the number of individuals new to education as well as males and individuals from diverse backgrounds.

Cumulative Program Hours Prior to Testing

Figure 4.6 provides the summary statistics for the cumulative program hours that a participant successfully completed prior to taking the Praxis #0353 multiple-choice test for the first time. The distribution of hours approximates a normal distribution with a mean of 19.787 and median of 19.00, though there is a slight skew toward fewer hours (i.e., some participants who did not attempt the test until very late in the program raise the mean despite the more frequent number of participants who attempted the test early). As seen in the boxplot in the middle of Figure 4.6, 25% of the participants took the

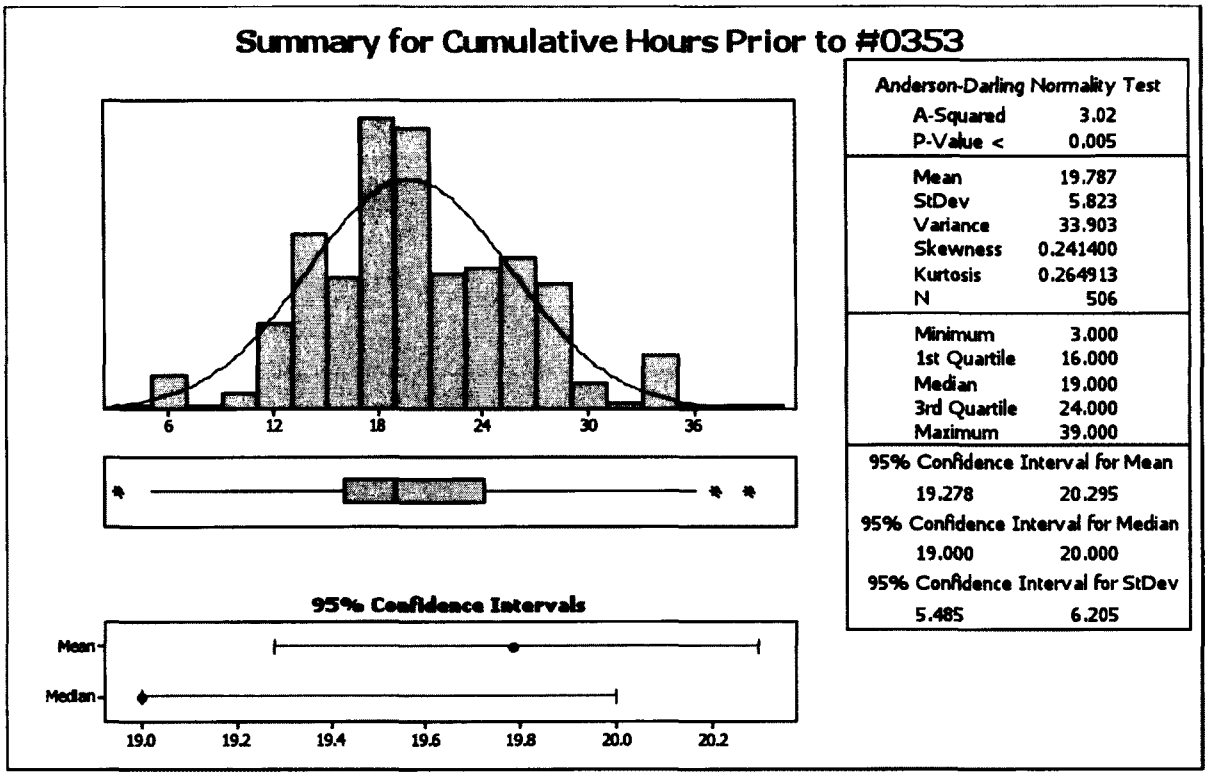
Figure 4.5. Participant undergraduate GPA scores by ethnicity and gender



multiple-choice test with fewer than 16 program hours, not the allowed 20 hours. There were no significant differences in cumulative hours before taking the Praxis #0353 test across graduation years or those not yet completing the program. In an analysis of cumulative program hours by cell, the mean number of hours prior to taking the Praxis #0353 is the lowest for candidates new to education, in this case with Cell 4 new-to-education candidates in traditional field settings ($M = 17.965$), followed by Cell 3 new-to-education LBD teachers ($M = 19.488$). Based on a one-way analysis of variance (ANOVA), these are statistically significant differences in cumulative hours by cell (3, 506; $p = 0.000$, $F = 22.97$), and these differences are moderate. This finding may be moderated by the study procedure that some already-certified candidates were credited with specific courses that they had already taken during their prior teacher education program (i.e., reading and math methods). However, the cumulative number of hours

including this prior preparation is an important consideration in preparation for testing. The implication is that the candidates with the least pre-program background preparation tend to take the fewest program hours prior to attempting the Praxis #0353 test for the first time.

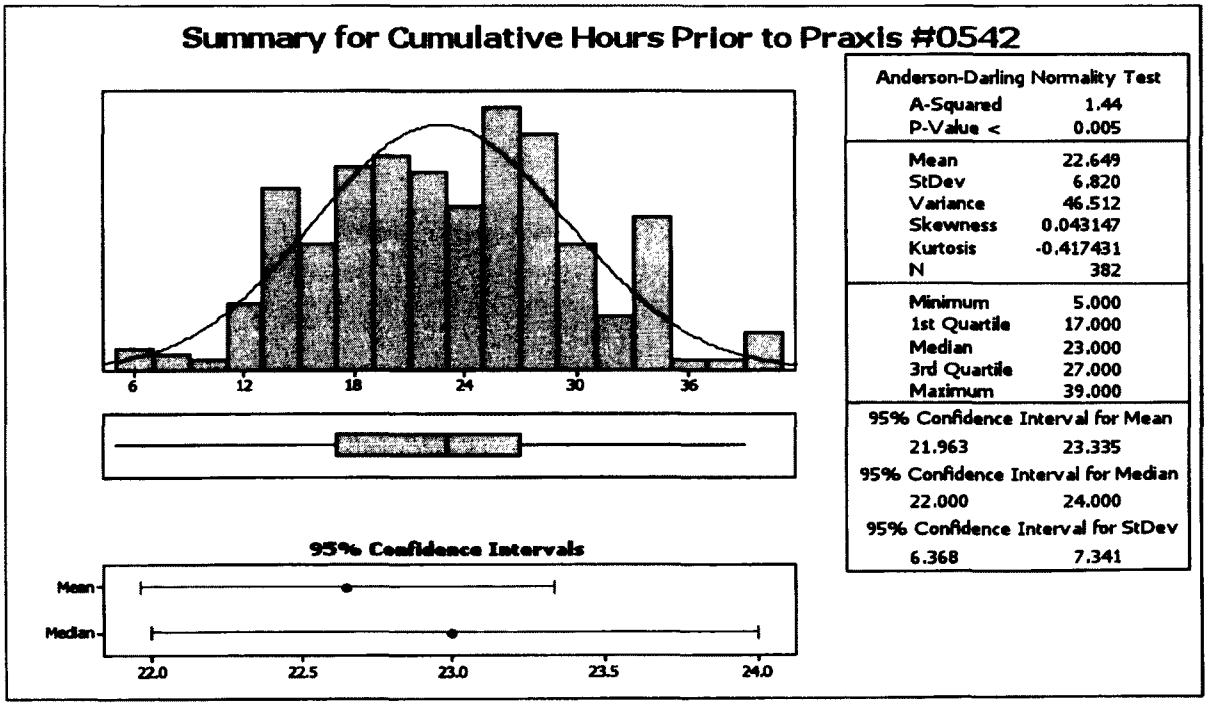
Figure 4.6. Descriptive statistics for cumulative program hours prior to Praxis #0353



In similar fashion, Figure 4.7 provides the summary statistics for the cumulative program hours that a candidate successfully completed prior to taking the Praxis #0542 scenario test for the first time. The distribution of hours approximates a normal distribution centered around 23 hours, with the mean of 22.649 and median of 23.00, indicating a slight skew toward fewer hours. Of concern again is that 25% of the individuals took the multiple-choice test with fewer than 17 program hours, although the requirement for taking the second Praxis test is not until program completion at 37-39 hours. A one-way ANOVA between cumulative hours taken before the scenario test and

the graduation year or still active status reveals a significant difference ($p = 0.000$, $F = 8.85$) of small to moderate effect, with 2008 graduates taking an average of only 19.701 hours, compared to 2010 graduates who completed an average of 24.879 hours before the test. There is the possibility that candidates were encouraged to take the test at an earlier stage in their program prior to 2008. In an analysis of cumulative program hours by cell, the mean number of hours prior to taking the Praxis #0542 is the again lowest for candidates new to education, in this case with Cell 4 new-to-education candidates in traditional field settings ($M = 21.040$), followed by Cell 3 new-to-education LBD teachers ($M = 22.385$). Based on a one-way ANOVA, there are statistically significant differences by cell in mean number of cumulative hours for the scenario test, though with a much weaker effect than for the multiple-choice test (3, 382; $p = 0.000$, $F = 6.70$). Again, the candidates with the least pre-program background tend to complete the fewest program hours prior to attempting the Praxis #0542 test for the first time.

Figure 4.7. Descriptive statistics for cumulative program hours prior to Praxis #0542



Program Sequence and Clusters of Courses Taken

Summary descriptive statistics for the clusters of courses taken prior to the Praxis #0353 multiple-choice test are provided in Appendix K. Of the five courses in the Exceptional Child methods cluster, 75% of candidates have taken between 4 and 5 of these ($M = 4.4328$, $Mdn = 5.0000$), which follows program guidelines. However, for the LBD Field Course cluster where they are to complete the first two of the three field courses prior to taking the first Praxis test, the mean and median number of field courses is just 1 (0.97233 and 1.000 respectively). In addition, candidates have typically taken only one General Education course prior to taking the multiple-choice test ($M = 0.99802$, $Mdn = 1.0000$), although these education methods courses are not part of the current continuous progress requirement of completing 20 hours for taking the first Praxis. In comparing the courses taken prior to Praxis #0353 in each cluster across the four candidate background/field context cells, there is no significant difference between cells in the number of core Exceptional Children courses, but there are differences for the other two clusters. In the LBD field courses, participants in Cell 4 New/Traditional field experiences have had significantly fewer field courses. A strong difference is in the General Education Methods courses, where the candidates new to education (Cells 3 and 4) have significantly fewer hours in this area before taking the Praxis #0353 test for the first time (3, 506; $p = 0.000$, $F = 50.50$). This difference is likely an artifact of the current ABC policy that general education methods courses should be taken after successfully passing the first Praxis test, and of the study procedure of crediting already-certified candidates with education methods courses that they had completed in their previous preparation program.

Appendix K also contains more detailed information on the courses taken prior to the Praxis #0542 scenario test. Since the scenario test is usually taken second if not at the same time as the multiple-choice test, the number of courses taken in each cluster is somewhat higher prior to the scenario test. The difference in mean numbers of courses is statistically significant by background/field cells for each of the clusters of courses, although the effect is small. For the Exceptional Children Core cluster of courses, in an unusual twist, candidates in Cell 1 took the least of these courses prior to taking the test though the difference is minimal (3, 382; $p = 0.042$, $F = 2.75$). For the LBD Field cluster, Cell 4 candidates new to education/traditional field experiences took the least courses, though again differences between cells are minimal (3, 382; $p = 0.055$, $F = 2.56$). Candidates may take the General Education cluster courses prior to taking the second Praxis test which allows the candidates new to education to "catch" up with those already certified. However, a moderately strong and significant difference remains for the scenario test, with individuals in Cells 3-4 who are new to education taking fewer general education methods courses prior to the Praxis #0542 test for the first time (3, 382; $p = 0.000$, $F = 17.65$). Because many participants took the scenario test earlier than required, often at the same time as the multiple-choice test, the difference between cells in the General Education course cluster is again likely an artifact of current ABC policy and study procedures crediting prior education methods courses to already-certified candidates.

Altogether the descriptive statistics on the study participants, the dependent variables of the two Praxis test scores, and the independent variables provided direction for the development of the elaborated model and interpretation of the results.

Statistical Study Results

Research Question 1: Is there a difference in the professional knowledge of special education and teaching practices for initial special education candidates as measured by Praxis™ II licensure tests, based on (a) their prior background (i.e., prior teacher certification in another area extended to LBD, or initial teacher preparation), and/or (b) their field context in the program (i.e., employed as a special educator in an alternate route program or obtaining classroom experiences in traditional ways)?

To answer Question 1, an analysis of variance (ANOVA) was conducted using a general linear model to determine whether an individual's Praxis #0353 multiple-choice test score (Y_1) can be predicted from two independent variables or factors: (1) the individual's pre-program background, i.e., a dichotomous variable of already certified or new to education (Background), and (2) the individual's context for LBD field experiences at the time of taking the #0353 test, i.e., a dichotomous variable of employment as an LBD teacher or traditional field context for LBD practicum (0353Field). Because these two variables can be crossed (i.e., each level of one of the variables can occur in combination with each level of the other variable), the model also includes a factor for this interaction (Background*0353Field). This can be written as follows.

$$Y_1 = \text{Constant} + b_0\text{Background} + b_1\text{0353Field} + b_2\text{Background*0353Field}$$

ANOVA results for the simple model show that an individual's background in education has a statistically significant but small effect on their Praxis #0353 score (p = 0.017, F = 5.74), whereas there are no significant effects on the test score for the field context (p = 0.409, F = 0.68) or the interaction between the two factors (p = 0.842, F = 0.04). The model has little predictive value (r^2 = 1.24%), meaning that only 1.24% of the

variance in the Praxis #0353 multiple-choice test scores can be predicted from background and field context.

Similarly, a general linear model ANOVA for the individual's Praxis #0542 scenario score (Y_2) was conducted to determine if the individual's pre-program education background (Background) and field context at the time of taking the test (0542Field) with an interaction factor between the two (Background*0542Field) has predictive power. The model for the scenario test is as follows.

$$Y_2 = \text{Constant} + b_0\text{Background} + b_1\text{0542Field} + b_2\text{Background*0542Field}$$

From the ANOVA for Praxis #0542, an individual's education background again is statistically significant and has somewhat stronger predictive value ($p = 0.000$, $F = 12.64$), but the field context and the interaction between the two crossed variables are again not significant or useful in prediction ($p = 0.371$, $F = 0.80$, and $p = 0.151$, $F = 2.07$, respectively). Compared to the Praxis #0353 results, the model for the Praxis #0542 score has somewhat more but still minimal predictive value. Only 4.49% of the variance in the score is predicted from the model ($r^2 = 4.49\%$).

In short, the simple model for both Praxis tests suggests the importance of a candidate's pre-program education background but provides minimal predictive value. This information was used in the second research question which addresses a more elaborate model. Appendix L contains more complete statistics for Research Question 1.

Research Question 2: How well do prior background, field context, and other variables (i.e., cumulative program hours, clusters of program courses successfully completed and general candidate achievement) explain candidates' levels of professional knowledge in special education and teaching practices?

Variables in the More Complex Model

Undergraduate GPA. The descriptive statistics for the different independent variables of interest and the results of Question 1 were used to make some adjustments from the variables initially proposed in order to build the model for answering Research Question 2. The participant's undergraduate GPA is a facsimile for overall achievement, and, as previously reported, there are significant differences in the undergraduate GPA by cell, gender and ethnicity. However, as previously shown by Figure 4.5, there is a range of GPA's across demographic groups. Consequently, the undergraduate GPA was included as a separate variable in the full model.

Background and field. In the initial results for Question 1, the participant's pre-program teacher preparation (Background) shows some importance but the context for LBD program experiences (Field) was not statistically significant. Therefore, the full model included pre-program background as a separate variable, but the field context was discarded as a separate variable. Although the Question 1 results did not indicate an interaction effect, the descriptive statistics indicated there were significant differences in demographics between participants according to Background/Field cells. Therefore, scores for the two Praxis tests were reviewed based on the Background/Field cell to determine applicability to the complete model. Figure 4.8 shows the Praxis #0353 multiple-choice test scores by cell. Although at least 75% of participants in all four cells exceeded the 157 state passing score the first time, scores are generally higher in Cells 1 and 2,which are composed of participants already certified in another area. Overall scores are somewhat lower for participants new to education in Cells 3 and 4, which include the lowest range of scores, all the outliers, and all the participants who failed both tests in their first attempt.

Figure 4.8. Praxis #0353 test scores by background/field context cells.

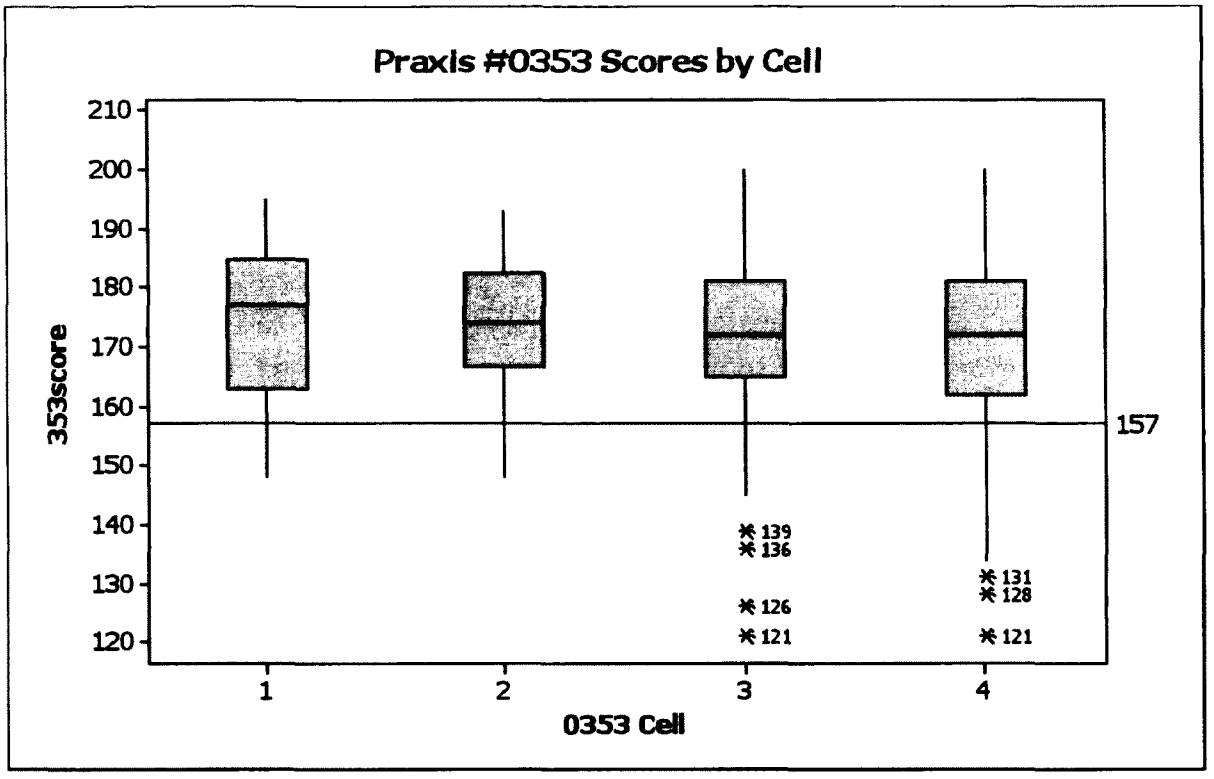
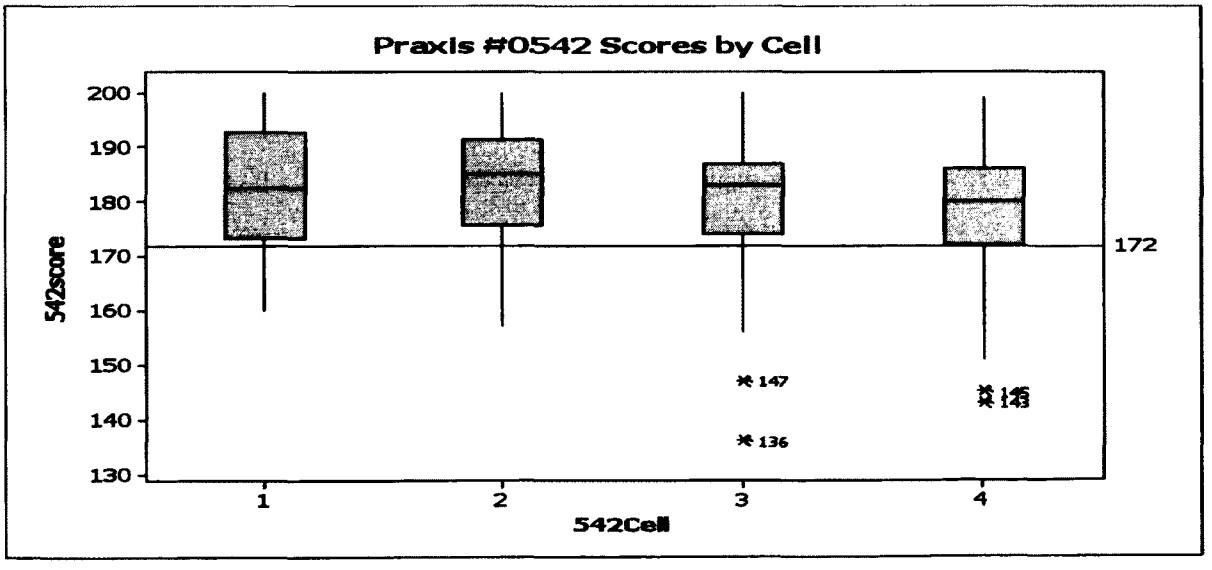


Figure 4.9 shows the same information for the Praxis #0542 scenario test scores, with similar results. Given these results, the participant cell for each of the two tests was included as a variable in the model.

Figure 4.9. Praxis #0542 test scores by background/field context cells.



Gender and ethnicity. Although there are demographic differences in gender and ethnicity between the Background/Field cells, all cells include a mix of participants as previously provided in Tables 4.1 and 4.2. Consequently, these two variables were included separately in the full model. Figure 4.10 provides the Praxis #0353 multiple-choice test scores by gender and ethnicity. Each group shows a range of scores, including participants scoring below the 157 state passing score the first time, as well as individuals scoring well above that level.

Figure 4.10. Praxis #0353 test scores by gender and ethnicity

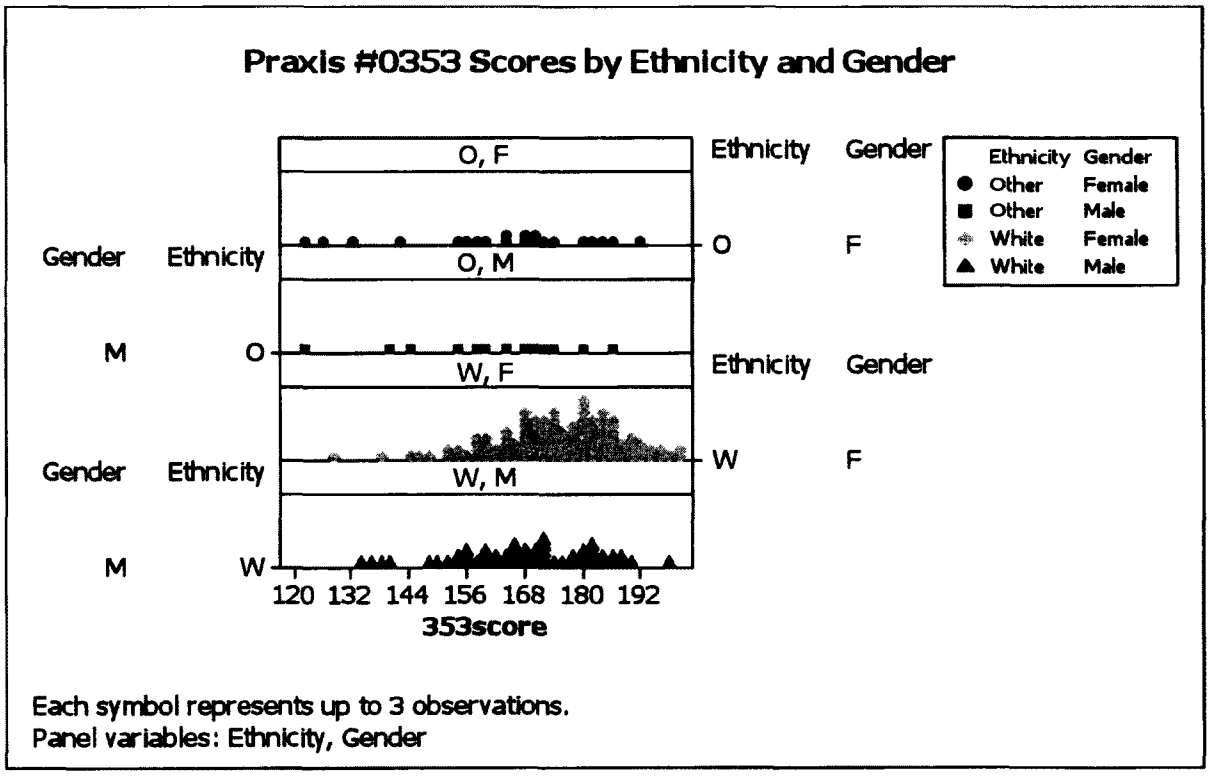
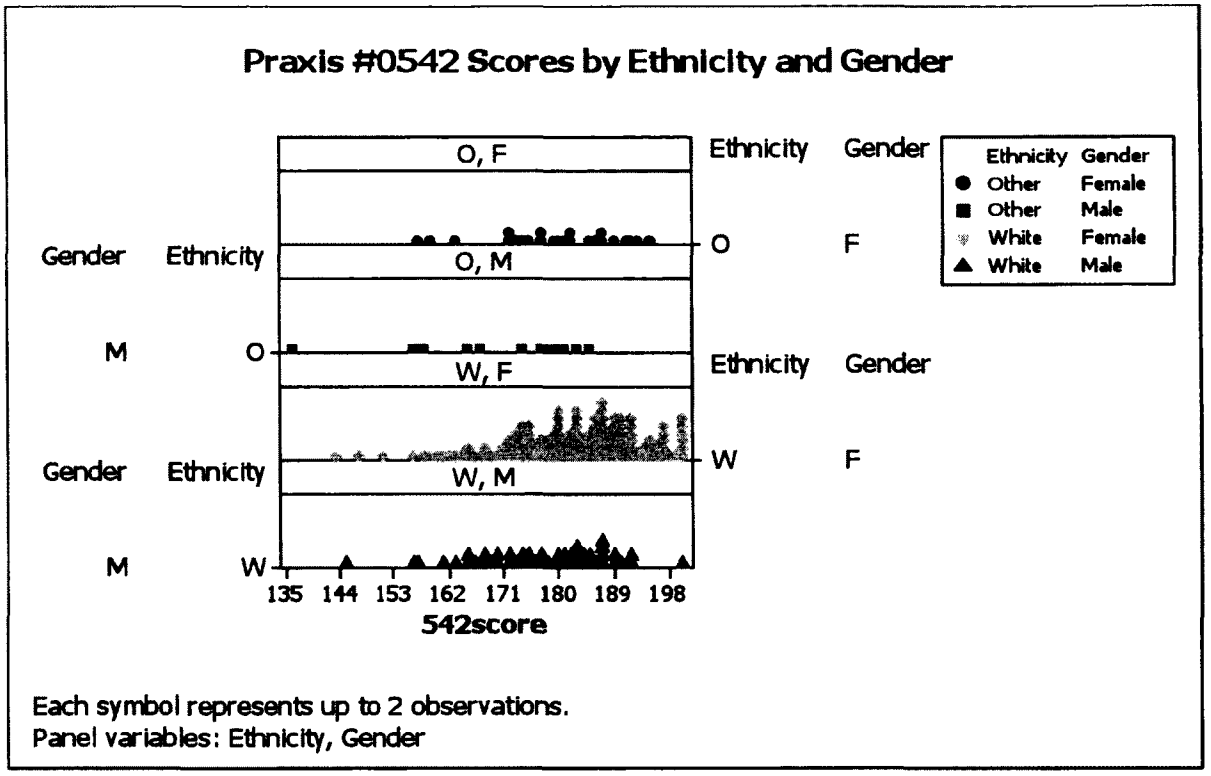


Figure 4.11 provides similar information for the Praxis #0542 scenario test results. Again, each group by gender and ethnicity shows a range of scores, including some below the 172 state passing score and others well above.

Figure 4.11. Praxis #0542 test scores by gender and ethnicity



Cumulative hours and course patterns. Two LBD program variables for consideration in the model included the cumulative hours completed successfully prior to each test and the specific course clusters (i.e., Exceptional Child methods, LBD Field courses, and General Education methods courses). Previously discussed, there are statistically significant differences in cumulative hours completed prior to each test, with participants who are new to education and without prior teacher preparation background taking fewer hours on average before testing. Although these differences showed only a small effect, the variable of cumulative hours was included for each test in the full model. However, the descriptive statistics in Appendix K for the average number of courses in each cluster taken prior to each test show some differences by cell, but there is little correlation to scores for either test. As a result, the cluster variables were dropped from the full model for parsimony.

Use of subtest scores. Subtest scores of each Praxis test were considered for side study. However, no correlations of size or significance between subtest scores and average courses taken in any specific cluster were found. Therefore, subtest score analysis was not conducted. Appendixes H and I contain Praxis test score and subtest score data.

Full Model for Praxis #0353 Scores

An analysis of variance (ANOVA) was conducted using a general linear model to determine whether an individual's Praxis #0353 multiple-choice test score (Y_1) can be predicted from the following variables, selected from the analysis of the simple model in Question 1 and the descriptive statistics: (1) participant's undergraduate grade point average; (2) cumulative program hours prior to first attempting the Praxis #0353 test; (3) the candidate's pre-program background as already-certified or new to education; (4) Background-Field cell at the time of taking the Praxis #0353 test for the first time; (5) gender, and (6) ethnicity. This can be written as follows.

$$Y_1 = \text{Constant} + b_0\text{GPA} + b_1\text{CumHrs} + b_2\text{Background} + b_j\text{Cell} + b_4\text{Gender} + b_5\text{Ethnicity}$$

Table 4.3 provides the results for the general linear model ANOVA for predicting the Praxis #0353 test score from these six variables. Overall, the model has some predictive value, with 14.21% of the variance in the score explained ($r^2 = 14.21$), though this leaves approximately 85% of the variance unexplained. Of the variables in the full model, the participant's pre-program background and background-field cell have no statistical significance, despite the demographic differences across the cells as well as the assumption that already-certified teachers would have an advantage. Of the statistically significant variables in the full model, gender and ethnicity appear to play a strong role in predicting the score, and a smaller role is played by undergraduate GPA and cumulative

hours prior to initial testing. The small role the cumulative hours variable plays could indicate that the content and/or the quality of the specific courses taken are more important than the total hours, though the variables for the clusters or patterns of courses were omitted from the full model given the lack of correlation to test scores.

Table 4.3, Analysis of Variance of Model for Predicting Praxis #0353 Test Scores

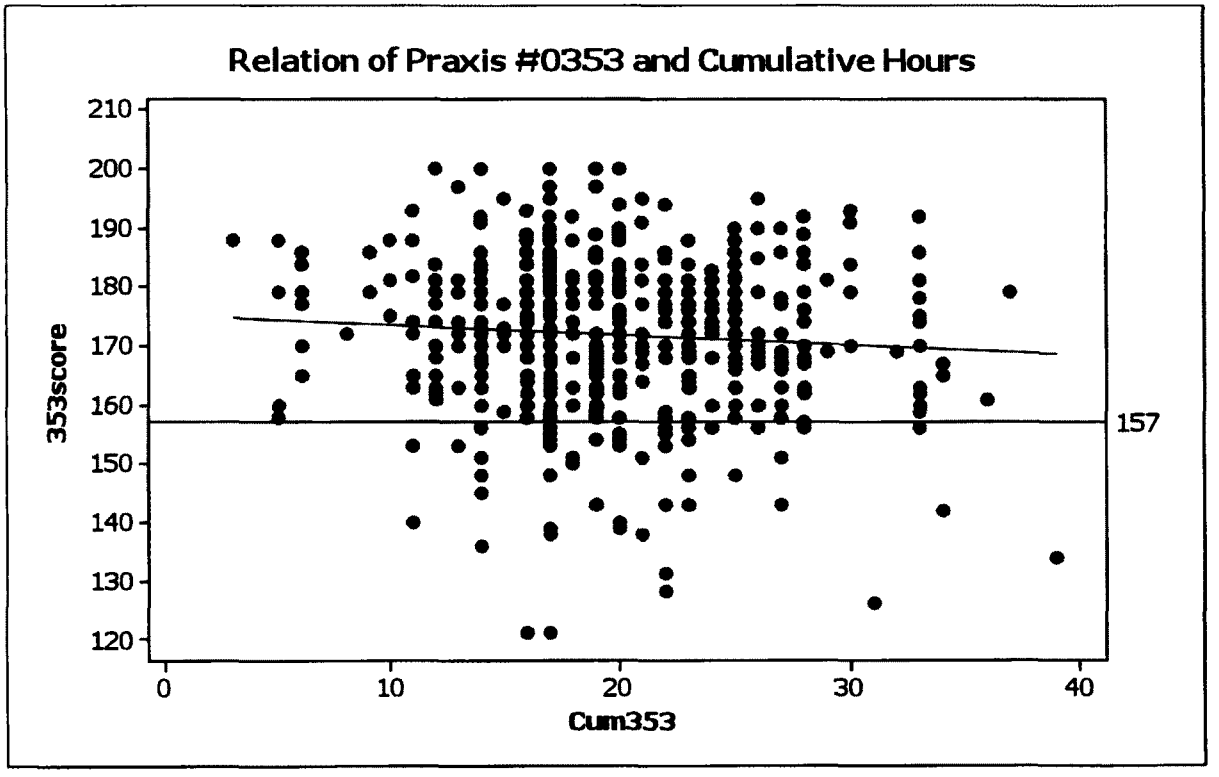
Source	*df*	*F*	*P*	Direction
Undergraduate GPA	1	6.99**	0.008	positive
Cumulative Hours	1	5.34*	0.021	negative
Background-Field Cell	3	1.73	0.161	--
Gender	1	24.11**	0.000	female
Ethnicity	1	20.76**	0.000	white
Background	1	0.00	0.998	--
S 12.1589				

* $p < .05$. ** $p < .01$.

Based on the direction of the coefficients for the variables calculated through the statistical program (see Appendix M), being white and female is advantageous to success on the multiple-choice test. Not surprisingly, higher undergraduate GPA's are associated with higher test scores. In an interesting twist, the number of cumulative hours in the program had a negative relationship with the multiple-choice score in the full model; the longer the candidate is in the program before attempting the test for the first time, the more likely the candidate may not do well on the test. Because it is intuitive that more hours would mean better preparation and success, one possibility for the counter-intuitive result is that participants who are confident of their test-taking skills attempt the test earlier, while those who expect to experience difficulty on the multiple-choice test delay

taking it until late in the program. In a review of the data, most of the very early test-takers (i.e., those taking the multiple-choice test before completing 12 program hours) were successful and were candidates who already held another certificate. Of the 56 participants who failed the multiple-choice test on the first attempt, their mean and distribution was very similar to the total group of participants. Figure 4.12 provides a scatterplot of the relationship between cumulative hours taken prior to initial testing and the Praxis #0353 score, indicating the success of very early takers as well as a lack of notable numbers of candidates delaying until very late in the program who failed.

Figure 4.12, Relation of cumulative hours before testing and Praxis #0353 test scores.



Analysis of the scores below 157 in Figure 4.12 indicated that 37.5% of these failures occurred during 2010 testing dates as compared to the 27.9% of all initial testing that occurred in 2010, suggesting something may be occurring during this time period. The average number of test-takers who did not meet the state cut-off score has increased

over recent years, from 9.6 % of test-takers in 2008, to 14.43% in 2009 and 14.58% in 2010. Possible explanations include (1) a change in the LBD program Praxis preparation sessions to a desktop audio conferencing format, rather than face-to-face; (2) more consistent tracking of candidates for testing by 20 hours in the program which was started in mid-2009 and may have led some candidates to early testing without the necessary exceptional child methods and field courses; and/or (3) an overall greater number of traditional candidates new to education taking the test over that time.

In short, the combination of undergraduate GPA, gender, ethnicity, and cumulative hours prior to testing help predict success on the multiple-choice test, but together account for only a small part of the variance (i.e., about 12 %). The results indicate that other variables not identified in the model play a more important role.

Full Model for Praxis #0542 Scores

In a similar manner, a second analysis of variance (ANOVA) was conducted using a general linear model to determine whether an individual's Praxis #0542 scenario test score (Y_2) can be predicted from the following variables, selected from the analysis of the simple model in Question 1 and the descriptive statistics: (1) participant's undergraduate grade point average; (2) cumulative program hours prior to first attempting the Praxis #0542 test; (3) the candidate's pre-program background as already-certified or new to education; (4) Background-Field context cell at the time of taking the Praxis #0542 test; (5) gender, and (6) ethnicity. This can be written as follows.

$$Y_2 = \text{Constant} + b_0\text{GPA} + b_1\text{CumHrs} + b_2\text{Background} + b_j\text{Cell} + b_4\text{Gender} + b_5\text{Ethnicity}$$

Table 4.4 provides the results of the general linear model ANOVA for predicting the Praxis #0542 test score from these variables. The full model for the scenario test has some predictive value, with 14.56% of the variance in the score explained ($r^2 = 14.56$),

though this leaves approximately 85% of the variance unexplained, similar to the results for the multiple-choice test. Of the six variables in the full model, cumulative hours in the program, ethnicity and pre-program background have no statistical significance. Compared to the multiple-choice test, gender appears less important than on the multiple-choice test, but still in favor of women, and undergraduate GPA has a moderately greater predictive value than on the multiple-choice test. For the scenario test, there is a significant difference between the cells although the effect is small. The direction of the coefficients for the different cells supports the assumption that already-certified teachers have an advantage in applying strategies. In short, the combination of undergraduate GPA, gender and pre-program background/field context cell, help predict success on the scenario test, but together account for only a small part of the variance (i.e., less than 15%), leaving other factors to explain more of the variance in scores. $r^2 = 14.09\%$

Table 4.4, Analysis of Variance of Model for Predicting Praxis #0542 Test Scores

Source	*df*	*F*	*p*	Direction
Undergraduate GPA	1	11.30**	0.001	positive
Cumulative Hours	1	1.54	0.216	--
Background-Field Cell	3	4.13**	0.007	--
Gender	1	15.10**	0.000	female
Ethnicity	1	3.46	0.064	white
Background	1	0.56	0.454	--
S 10.2697				

** $p < .01$.

Qualitative Study Results

Research Question 3: To what do candidates attribute their development of content and pedagogical knowledge in special education and teaching?

Participants. Based on the methodology described in Chapter III for the qualitative study, participants were recruited to provide input and recommendations in four focus groups according to their pre-program background and field context for experiences: (1) already-certified teachers who were employed to teach LBD at the time they first attempted a Praxis test; (2) already-certified teachers who were learning through traditional field experiences; (3) individuals new to education employed as an LBD teacher through a temporary provisional certificate; and (4) individuals new to education who were learning through traditional field experiences, practicum and student teaching. A total of 11 participants provided focus group information through audio desktop conferencing in small group or through individual phone interviews. Although participation was lower than the planned 5-6 people per group (i.e., total of 20-25), there was balance across background/field context groups. Given the small size of the groups, there was not representation in each group for ethnicity, gender and geographic region; however, the overall representation in these demographic characteristics roughly approximated the overall participant pool except in geography; more specifically, the eastern part of the state was not represented. Unfortunately, none of the participants had the experience of failing a Praxis test although such candidates were included in the initial selection of invitees. Table 4.5 describes the characteristics of the participants, showing the balance across characteristics.

Table 4.5, Focus Group Participants

Participant Characteristics	Balance (n = 11)
Background/Field Context Group	2 already-certified, teaching LBD/alternate route (group 1)
	3 already-certified, traditional field experiences (group 2)
	3 new to education, teaching LBD/alternate route (group 3)
	3 new to education, traditional field experiences (group 4)
Ethnicity	9 white, 2 other
Gender	10 females, 1 male
Location in state	4 northern, 1 western, 5 central
Testing success	11 succeeded on first attempt

Themes specific to a group. Summaries of the group responses to the questions that are presented in Table 3.8 appear in Appendix N, organized by background/field context group. It should be noted that the groups were established by the participant's field status at the time of initial testing (i.e., teaching LBD or learning through traditional field experiences). Of the two groups where participants were identified as having traditional field experiences, most had in fact taught LBD after initial testing either while still in the program or were teaching LBD at the time of the interview, and all participants had teaching experience in some context at the time of interview. This experience enabled participants to reflect back on what was needed in the classroom by LBD teachers. In Group 1, the participants were already certified in another area and hired to teach LBD at the time of initial testing. This particular group seemed to get into special education primarily as a response to an unsuccessful job search in their initial certification area, although this cannot be generalized. One participant said that she was interested from her undergraduate degree in elementary education but that several job

interviews led her to the field. While confident in their basic teaching skills, this group was primarily focused on learning special education paperwork and procedural requirements as well as how to differentiate instruction for students with different disabilities and monitor their progress. Their primary sources for acquiring their special education knowledge was in the field, through mentors, hands-on experiences, and their own reflective processes.

Group 2 also consisted of teachers already certified in another area, but in this case not teaching LBD at the time of initial testing. As a difference with Group 1, Group 2 seemed to go into special education out of desire to pursue greater skills, whether in general or special education, and as one said, "It actually helped me become a better teacher – a lot of insights into teaching and my career." After entering the program, several ended up in special education later. Group 2 participants had similar concerns to Group 1 regarding procedures, paperwork, progress monitoring and differentiating for different types of disabilities. However, across the already-certified participants in Groups 1 and 2, only one participant whose certification area was physical education mentioned the need to learn and know core content (i.e., general education curriculum). The participants in traditional field experiences focused on collaboration and co-teaching, seeing how this works from a new perspective. Given that they were generally teaching regular education during the program, they saw coursework as important sources for their learning but also focused on the field and practicum aspects. One participant said, "I dreaded the field work and thought it would be a pain, but I learned from it and the teachers I work with."

Group 3 participants were new to education and employed as an LBD teacher at the time of attempting the Praxis test for the first time. According to comments,

participants had wanted to be an educator early in their lives but had taken a different career path; as one said, "I had a heart for students with and without disabilities." Themes were similar to the already-certified groups in the importance of knowing due process, paperwork, disabilities and differentiation for students, adding an emphasis on autism. But they also saw more of a need for assessment skills, probably given their lack of background in education. In particular, they expressed a need to learn a new culture, not just of the school and general education, but of special education. Like the already-certified LBD teachers, Group 3 participants saw the field experiences and hands-on applications as most important, with the course work in support of that. One said that what was important was "working and taking classes at the same time and seeing the connection, " or by another, "specific field experiences and on-the-job training with students." The Praxis scenario test was seen as applicable to what they were doing and much more straightforward whereas the multiple choice test was not as relevant to what they were doing.

Finally, Group 4 participants were both new to education and acquiring their field experiences through traditional means rather than LBD teaching. Like the others, important areas they saw as needed by LBD teachers were due process procedures, paperwork, IEP's and disabilities. However, they had particular concerns for the terminology in education, particularly in special education. They noted that their main source of knowledge was through the practicum experiences, but often not until the last field course (ECE 576 final clinical practice). One who obtained an LBD teaching position after the testing indicated that the real learning came when beginning to teach LBD. and several noted the need for more experiences prior to ECE 576 final clinical practice. Like the others new to education as well as those already certified, the Praxis

sceanrio test was more direct and focused on what they had learned, though they had received the information for the multiple-choice test through course work.

Themes across groups. All of the groups made positive comments about the strength of the ABC program and that participants had referred others to the program. For example, "It is an exceptional program and I refer people to it," "All the professors want us to be successful, they are very encouraging", and "The support and going above and beyond the call of duty for students." While participants made positive references to course work and professors, they consistently reported the major source of their special education knowledge was through the field experiences, assignments, local mentors, college supervisors, and colleagues at school.

Focus group recommendations. Recommendations for program improvement from each of the focus groups were remarkably similar in some aspects but also indicated differing needs between the groups. For example, all groups recommended specific training and experience in special education forms in addition to the IEP (e.g., state forms used at meeting and in student records), though participants new to education wanted more on the IEP as well. Another need expressed across groups was more preparation in behavior management and behavior intervention plans in the field courses. In general, Group 4 (i.e., new to education with field experiences through traditional means) had the most needs, apparently perceiving the greatest gaps in the program from their perspective, from foundational information about schools, to terminology and logistical preparation for student teaching. Table 4.6 summarizes the recommendations from the groups. Because the participant recommendations were generated through open-ended responses from small samples separated into groups and sometimes conducted through individual interviews, the listing should be viewed as one source of data for triangulation

with the statistical study results for developing program improvement recommendations, not as a listing of recommendations with consensus from all participants.

Table 4.6, Focus Group Recommendations for Improvements

Recommendation	Group 1 Certified-LBD	Group 2 Certified-Tradition	Group 3 New-LBD	Group 4 New-Tradition
Field Component				
• More practicum and hands-on, as soon as you start the program			x	x
• More experience with behavior management and intervention plans		x	x	x
• Preparing for student teaching, logistics and financial support during semester				x
Specific Content				
• More on autism			x	
• Foundational information and readings at the beginning for those not from education				x
• Preparation for school "data" day (state-federal assessments, annual yearly progress)				x
• How to do collaborative or co-teaching		x		x
• Examples of response to intervention models, logistics, scheduling				x
• More high school applications				x
• Connections to preschool				x
Special Education Paperwork and Procedures				
• Experience in conference summaries, other forms (not just IEP)	x	x	x	x
• Writing an IEP, meetings, role plays		x		x
• Statewide electronic student data system, special education section		x		x
• Acronyms at the beginning		x		x

Chapter Five

Discussion and Conclusions

Key Findings

The purpose of this study was to investigate different levels of knowledge and skills of special educator candidates at key points in their preparation program, using scores of two different state licensure tests as the dependent measures: the Praxis #0353 multiple-choice test and the Praxis #0542 scenario applications test. As an exemplar, ABC College has a large graduate program preparing candidates for teaching students with LBD, and data for candidates from different pre-program backgrounds and field contexts for LBD experiences were examined.

From an ecological perspective, the interactions between certain program features, settings for field experiences, and candidate pre-program background and characteristics were used to examine how teachers develop their knowledge of special education and teaching practices using general linear modeling to predict scores on the two state teacher licensure tests. Qualitative input from selected participants on their knowledge and needs was also obtained, and the statistical and qualitative data were triangulated as a source of recommendations for program adjustments to improve results for teacher candidates. Although the findings from the statistical study were statistically significant, the models used to predict the scores accounted for only about 15% of the variance in scores, leaving 85% unexplained through the variables studied. However, the information derived has implications for issues in the field as well as institutional recommendations. Likewise, qualitative information from the focus group participants was based on a small sample, but has implications for teacher preparation.

Key findings include statistically significant differences between ethnicity and gender across groups, with participants new to education and teaching LBD through a temporary provisional certificate more likely to be male and/or a person of color. Related to the multiple-choice test, findings are that undergraduate GPA, gender and ethnicity play statistically significant roles in predicting licensure test scores rather than the participant's background as an already-certified teacher who is extending credentials to add LBD certification. In addition, the program variable of cumulative hours plays a statistically significant role in predicting multiple-choice scores, though the effect is small and counterintuitive with more hours not necessarily resulting in better test performance. For the scenario test, undergraduate GPA and gender continue to play statistically significant roles, similar to that in the multiple choice test, but ethnicity does not play a statistically significant role in the scenario format. Further, the combination of participants' pre-program background and field context for experiences does play a statistically significant role in predicting success on the scenario test that applies knowledge, in favor of already-certified teachers and those teaching LBD as part of an alternate route program, rather than those with traditional practicum experiences. Finally, patterns of courses are not helpful in predicting test scores of either type. Overall, despite statistical significance, the models hypothesized account for only a small part of the variance in scores, leaving 85-88% of the variance unexplained.

Focus group results from participants emphasized that much of the knowledge they need as a beginning special educator comes from local mentoring, hands-on experiences, school colleagues, and college professors in the field, more than coursework unless the content was applied directly in the field setting. Clearly, the nature of the field experiences, not just the setting, may explain more of the variance, as well as other

factors, such as personal motivation and approaches to test preparation. Although the statistical and qualitative findings should be viewed with caution, they can inform and add richness to responses to general issues in the field as well as to institution-specific decisions and recommendations.

Issues in the Field

Admissions standards and GPA. Every institution of higher education, whether undergraduate or graduate, has admissions standards for teacher preparation candidates, and minimum standards for entrance to teacher preparation may be set at the state level. However, there is variability across institutions, with the assumption that a higher undergraduate GPA can lead to higher quality teacher candidates, and there are periodic discussions in the field and at individual institutions related to raising the minimum undergraduate GPA for teacher education admission. While there is some merit to the assumption that a higher GPA leads to higher quality candidates, the finding in the current study that there is a statistically significant difference in undergraduate GPA's by the candidate's pre-program background (i.e., already certified or new to education) and field context (i.e., on the job training while employed as an LBD teacher via an alternate route program or learning through traditional field experiences) adds a level of complexity. Clearly, there are trade-offs between raising an entry GPA in the interest of teacher quality and the potential for excluding more diverse candidates from the classroom.

If the different demographics of the individuals new to education at the graduate level are ignored, the data indicating that undergraduate GPA's are lowest for alternate route teachers new to education as well as others new to education could be misconstrued to suggest that alternate route and career change programs that bring in candidates new to

the field promote lower quality candidates. Consequent efforts to raise the teacher preparation admissions GPA could have unintended negative consequences on efforts to broaden the teacher pool to be more similar to the K-12 student population demographics by including more males and individuals of color. As presented earlier, Figure 4.5 shows the spread of ABC College undergraduate GPA scores by ethnicity and gender for candidates admitted to the LBD program; the figure also helps visualize the impact on candidate demographics of moving the admissions GPA requirement from 2.75 to 3.0 or some other target. As discussed with Figure 4.5, the differences in mean GPA's between groups needs to be viewed in conjunction with the spread of scores for each group across a full range. Continued recruitment of men and individuals of color may require additional alternatives to the GPA as a primary admissions requirement as well as supports for those admitted with GPA below a certain average. Without alternatives and supports, raising GPA standards in isolation may be counter-productive. In addition, as suggested by the different ABC participant demographics in Tables 4.1 and 4.2 between the new to education LBD teachers (i.e., background/field context cell 3, and the other background/field context combinations), local school districts tend to employ men and teachers of color in LBD more frequently through alternate route programs, and these employment patterns may be unintentionally affected as well. Alternatives to the GPA as a major admissions criterion can include using the last 40-60 undergraduate hours instead of cumulative hours, or use of conditional admission for 6-12 hours to allow time to demonstrate academic proficiency. Supports for students admitted with lower GPA's could include (1) individual monitoring during the initial 6-12 hours to demonstrate application of organization, study skills, time management, and academic performance on

assignments; (2) study sessions; (3) participation in small academic support groups; and (4) individual mentoring by a faculty or peer.

Dual-certified special educators. Related to admissions criteria, recent discussions on teacher preparation include whether all special educators should first obtain a general education certificate to assure knowledge of curriculum content, and additionally obtain a special education credential for knowledge of disabilities, appropriate interventions, pedagogy, and other specialty areas (Brownell, Bishop, Gersten, Klingner, Penfield, Dimino, et al., 2009; Brownell, Sindelar, Kiely, & Danielson, 2010). However, there are striking and significant differences in demographics between ABC candidates who are already-certified and those new to education, with more men and persons of color among those new to education at the graduate level. While the intent of assuring discipline or domain knowledge is well-founded, promotion of dual certification in isolation may have negative unintended consequences on the policy initiative of recruiting for diversity. Data from the participants in this study who are adding a special education certificate suggest that simply promoting dual certification in special education may continue the current demographics of teachers being predominantly white and female, unless there are corresponding efforts to recruit and retain dual-certified men and teachers of color, not just recruiting alternate route and career change candidates into special education alone. Such efforts might include complementary or follow-up programs for alternate route candidates to address becoming highly qualified in specific content areas, not just special education strategies, as well as early pipeline efforts for career recruitment in high schools.

Format of licensure tests. In the current study, scores on two widely-used licensure tests in special education were the dependent measures of knowledge: the Praxis #0353 multiple-choice test and the Praxis #0542 scenario test. Although success on the multiple-choice test is associated with undergraduate GPA, gender and ethnicity (i.e., it is advantageous to be white and/or a woman), an interesting finding is that ethnicity is not statistically significant in the model for the Praxis #0542 scenario test. These data from the full model suggest that practical applications like scenarios may be more informative about what diverse test-takers know about special education and teaching practices than a multiple-choice format that requires quick processing of text with emphasis on vocabulary and language. Another interesting note is that an individual's combination of field experience setting and pre-program background (i.e., background/field cell) can differentially impact test scores related to scenarios or practical applications. Test-takers with prior teacher preparation or practicum experiences through alternate route programs may perform more strongly on applications than those new to the field with only traditional field experiences. While this makes intuitive sense, there are implications for decisions affecting the format of licensure tests.

One issue is whether there should be more emphasis on applications through scenarios or constructed-response rather than multiple-choice items in state or institutional selections of licensure tests. Although the Praxis II™ Technical Manual (2008c) notes that internal reliability and standard error of measurement are not calculated for the #0542 scenario test because of the limited number of items, this type of testing seems to have more social validity among focus group participants for relevance to the work of teachers. Another question is whether licensure tests without a constructed-response or scenario component can show adequate exposure to the

classroom to support licensure. Under final stages of discussion is a state plan to shift from the two tests currently required for LBD certification to a single, combined test which has more multiple-choice items and fewer items of scenario applications. While such a change may address some internal reliability and/or content issues, it may also have unintended consequences relating to issues noted for the multiple-choice format and lead to some potential disadvantage for men and candidates of color.

Alternate route v. traditional programs. To date there has much discussion in the field on whether alternate route programs can be as effective in preparing special educators as traditional programs. The current study lends support to the notion that alternate route programs can be effective and may have an advantage over traditional graduate entry-level programs when diversity differences are taken into account. It appears from the study that the quantity and quality of experiences for traditional graduate candidates new to education are more problematic than for alternate route teachers and require different approaches than those used for candidates with prior certification or employed in an alternate route position. Such different approaches could be in the intensity of field experiences as well as training in school processes and culture.

Altogether, findings from the current study add richness to policy issues at the state and national levels for discussions surrounding admissions criteria related to GPA, dual certification of all special educators, format for licensure tests, and differentiation of alternate route and traditional graduate-level programs. In particular, the demographic differences in the types of candidates enrolled in alternate and traditional graduate-level preparation programs have had little study to date and seem to be an overlooked dimension in policy discussions, beyond the general need for a diverse work force.

Institution-Specific Recommendations

Admissions criteria. Current ABC policy combines admissions into the graduate school based on a minimum undergraduate GPA (2.75 or alternative) supplemented by two professional recommendations, with simultaneous admission into the LBD teacher preparation program. Currently 12% of LBD applicants are admitted through GPA alternatives (i.e., GRE score, graduate GPA of 3.0 or higher after at least 12 hours, or review of the last 60 undergraduate hours). Applicants with undergraduate GPA's lower than 2.75 are over-represented among candidates struggling to pass Praxis tests. Therefore, changes in admissions policy regarding a higher GPA could be considered to promote a better Praxis test pass-rate and more knowledgeable teachers. However, simply raising the minimum GPA would likely have unintended consequences affecting relationships with public schools desiring to hire a more diverse workforce as well as potential decreases in admissions of diverse candidates and the consequent decrease in the teaching pool of diverse candidates. Instead, a different approach would be to continue the current graduate admissions criteria, but change the point of admissions to LBD teacher preparation to occur after a semester or more (e.g., 6-12 hours) in the program, during which time potential academic difficulties related to lower undergraduate GPA as well as a review of dispositions toward teaching and collaboration could be resolved prior to admission to LBD teacher preparation. This policy change could allow time for specific supports to be provided to candidates at risk of Praxis test or other problems (e.g., those with lower undergraduate GPA, particularly where this occurs in combination with gender or diversity considerations; those new to education who would be completing field experiences in a traditional context).

Continuous progress checkpoints. Currently, the ABC LBD graduate program has three checkpoints where individual candidate progress is reviewed before the candidate is allowed to continue further in the program: (1) Admission to LBD Teacher Preparation; (2) Eligibility for Final Clinical Practice (ECE 576) based on passage of at least one Praxis test and a maximum of 20 hours in the program, to include all the exceptional child methods courses and the first two LBD field courses; and (3) Program Exit, to include successful completion of the final clinical practice, all coursework with a minimum 3.0 graduate GPA, all Praxis testing, and an exit portfolio of work samples. Previously discussed recommendations for changes for Checkpoint 1 Admissions to LBD Teacher Preparation include moving this checkpoint from the time of admissions into graduate school to a point after certain LBD program hours (e.g., 6-12 hours). Given that there were no findings related to the specific or best timing of successfully taking a Praxis test along with an anticipated state change to a single, combined Praxis test for licensure, there is no data-based reason that testing be required as early in the program as is currently structured, although delaying to take the test until the end is not supported by the data either. The revised Checkpoint 1 could include the 6-12 successful hours completed as well as a self-assessment on the contents of the Praxis tests using the Test at a Glance materials from ETS (2008a-b) and/or other components that promote preparation for testing (e.g., documentation of attending an ABC testing orientation session or a personal study-preparation plan). A strategy of this type would shift the emphasis in Checkpoint 1 from meeting minimum requirements for graduate school admissions to readiness to succeed in the preparation program, including testing.

Checkpoint 2, Eligibility for Final Clinical Practice (ECE 576), currently occurs after 20 hours in the program. However, encouragement to complete final clinical

practice based only on exceptional child methods courses without having completed general education methods courses, especially in reading and math, may be premature. Consequently, given the recommended changes in Checkpoint 1 to 6-12 program hours, the 20-hour requirement for Checkpoint 2 could be deleted, allowing candidates to qualify for final clinical practice toward the end of the program, after completing all the exceptional child methods and LBD field courses, plus other courses based on a personal decision made in conjunction with an advisor. Application for final clinical practice would then include (1) confirmation of exceptional child methods and the first two field courses; (2) at least one passing Praxis test score, or the one Praxis score when the state changes licensure tests; and (3) one or more work samples from the two field courses (e.g., lesson plans, behavior plans, assistive technology implementation, professional growth plan, etc.). No changes to Checkpoint 3 Program Exit are recommended, based on findings from this study.

Mentoring and clinical applications. Although the statistical study did not address the details of the mentoring and clinical applications in the field courses, there was a statistically significant finding that the candidate's pre-program background combined with field setting plays a role in predicting success on the scenario applications test. Participants with previous certification and/or employment as an alternate route LBD teacher have an advantage over participants new to education in a traditional graduate program for initial certification. Although all of the focus group participants cited features of the field experience as the primary learning source (e.g., local mentors, school colleagues, hands-on practice, or college supervision in the classroom), the group that expressed the greatest gap in field experiences were the participants new to education in a traditional field context for practicum. This group indicated that they did not have enough

hands-on, field experience prior to final clinical practice. In addition, both groups of participants new to education, including those teaching LBD on a temporary provisional certificate, noted that they needed more background information about schools and the "special education culture" prior to or as part of their initial experiences in the program. Consequently, consideration for enhanced experiences at the beginning of the program and in the earlier field courses warrants consideration for those new to education, though these experiences may need to be differentiated by whether the individual is teaching on a temporary provisional certificate or in a traditional field setting. These enhanced experiences do not appear to be warranted for all or most of the already-certified candidates.

All of the focus group participants expressed a need for training regarding the paperwork for special education (i.e., completing the referral, eligibility, evaluation, and IEP meeting forms, in addition to the IEP itself). Possible solutions from the data include (1) adding a school orientation seminar in conjunction with a school partner for all candidates new to education as a supplement in the initial field course; (2) adding a field assignment specific to procedural paperwork to complete with the local mentor in the initial field course, the college supervisor or as part of the school orientation seminar; (3) developing a standard manual of state forms based on the special education statewide student data system for candidates in traditional settings to use and apply during early field courses; (4) enabling college supervisors to be onsite more frequently in the early field courses to provided targeted support; (5) for individuals new to education, adding required school contact hours prior to the more intensive mentored experiences in the current field courses; and/or (6) working in conjunction with local entities (e.g., special education cooperatives) to allow candidates in traditional settings to attend existing new

teacher orientation sessions. These ideas represent only a few ways to use the data from the current study to generate strategies in collaboration with school partners to improve the program.

Praxis supports. Supports for candidates new to education, particularly persons of color, can include some of the mentoring and field strategies discussed. Other supports can include assistance in areas of difficulty, such as Praxis test-taking. As noted earlier with regard to admissions and checkpoint recommendations, some candidates can be identified early as at risk of struggling academically on the Praxis tests or may be identified later. This difficulty could range from failing on the first attempt at either or both of the tests, to repeatedly taking and not passing the multiple-choice test, though this latter area was not part of the current study. Some risk factors include low undergraduate GPA, gender and ethnicity; however, from the analysis of undergraduate GPA and Praxis test scores by gender and ethnicity (i.e., Figures 4.5, 4.10 and 4.11), there are other risk factors at work, which could include low grades in the program, difficulty in organizing work or meeting timelines, language processing issues, and insufficient practice on the testing format. Focus group comments include statements of appreciation for the Praxis preparation sessions available, which were one to two hour overview sessions. However, because none of the focus group participants had failed one of the tests on the first attempt, none had received a targeted individual study session which was provided at the time for some students in the case of a failed test. After the time of the statistical data cut-off for the current study, a planned sequence of study topics for candidates failing a Praxis test was informally piloted with individuals and small groups in response to an increase in candidates failing a Praxis test. This pilot could be developed and formalized into a course or series of seminars targeted for candidates at risk, but open to others.

Traditional v. alternate route program design. Although a core group of courses is a useful curriculum organizer for the program, there are different needs between candidates according to prior education preparation and field context. The ABC program generally appears to be meeting the needs of candidates with prior teacher certification, regardless of their LBD field experience context. However, there are gaps for candidates new to education. Alternate route LBD teachers new to education requested more background on schools and personal supports in the beginning of their teaching, which suggests more intensive and coordinated mentoring between the employing school and the program in their first semester or year teaching. On the other hand, candidates new to education who receive LBD experiences through traditional placements need more mentored experiences overall as well as more early orientation to public school operations, practices and culture. This latter group of candidates could develop individual plans for sequential field experiences during the program as well as complete a school orientation through a special seminar or course as part of Checkpoint 1. Differentiating the program to address the needs for this group is a key institution recommendation from this study.

Limitations

Construct validity. Written tests are used across 39 states for licensure purposes, and the development of the Praxis II™ Series was based on input from the field for validity of test content in relation to the work of special educators (ETS, 2008c). Despite this effort, a written test can never measure the effectiveness of a candidate in the classroom with students and in the school with colleagues. For this latter purpose, ETS developed the Praxis III™ Teacher Performance Assessments (Dwyer, 1994) for state or local institutional use, and these assessments consist of direct observation in the

classroom, structured interviews with the candidate, and review of documentation, e.g., lesson plans. Because the current study focuses exclusively on written tests, it is limited by the nature of the test itself. Success on a written test, even the Praxis #0542 scenario test, has not been linked to effectiveness in the classroom or school. Consequently, findings and recommendations are limited to success on meeting a gatekeeper requirement for teaching, not success in the classroom. However, as long as written tests are used as a minimum criterion for licensure, an important area of study will be the use of those tests and implications for successful test performance.

Use of an exemplar program. A large program with both alternate route and traditional graduate level initial preparation was the focus of study, and this exemplar provided the opportunity to make comparisons across candidate pre-program certification status as well as across traditional and alternate routes for initial special education certification at the graduate level. Given that the 506 participants include graduates over the three years 2008-2010 and candidates still in the program, the sample size allowed sufficient numbers across various categories and features for statistical study. However, despite the sample size, the selection of the institution was neither random nor balanced by comparison institutions. In addition, although this convenience sample exhibits some diversity across participants, almost all participants of color were African-American, with few if any individuals from Hispanic, Native American or Asian cultures, making generalization to other groups questionable. Applicability of findings to other institutions is limited by similarity of program demographics and features. As stated by Rosenberg. Sindelar, Boyer, and Misra (2007). "AR [alternate route] programs are heterogeneous in length, support, and program intensity; and educators and policy makers must not view

programs that deliver a research-based curriculum in a coherent programmatic fashion in the same light as those that make little or no effort to do so" (p. 238).

Amount of unexplained variance. This study used an ecological approach to hypothesize that the interactions of program features, settings and people would have an impact on candidate knowledge as measured by the Praxis tests. A preliminary, simple model was tested for predictive value of a candidate's pre-program background in teacher education and the individual's setting for field experiences in the program, with statistically significant results that background plays a role in predicting scores for both the multiple-choice and scenario tests. From this, a more complete model was tested which used pre-program background, cumulative program hours prior to testing, and a variable combining the context for field experiences and pre-program background (i.e., background/field cell) along with undergraduate GPA, gender and ethnicity. Significant results for prediction were found for some of the variables in the model: undergraduate GPA, cumulative program hours before testing, gender and ethnicity for the multiple-choice test; and undergraduate GPA, background/field cell, and gender for the scenario test. Although the model for each test shows some predictive value parsed out for the variables, there is still much left unexplained. With only 14-15% of the variance in test scores explained, the findings should be viewed cautiously.

Focus group selection and process. The complementary qualitative study was designed to generate discussion in small focus groups on the ways that participants believe their knowledge of special education and teaching practices developed, with a desktop audio conferencing format to enable participation from individuals across the state. Because of scheduling problems for the qualitative component, two of the focus group sessions were cancelled and replaced by individual phone interviews, which did

not allow group dynamics for generating ideas and discussion. Further, participation overall was lower than desired despite recruitment efforts and no individuals who did not pass both Praxis tests the first time elected to participate, leaving a void in this area. Although the individuals for initial contacts were selected in a neutral, balanced approach and program faculty affirms the credibility of comments, selection bias of those willing to participate and small sample size limit the content and generalizability of findings. Given the difficulties, a more systematic phone interview process with a larger sample and/or written surveys of a larger sample or all statistical study participants could have been used in place of focus groups.

Future Research

Although the variables selected for examination in this study have provided some insights into the ecological impact of program features, setting and people on licensure test success as a measure of professional knowledge, the amount of variance in test scores that is unexplained by the model emphasizes the need to examine other variables that can effect test performance, such as (1) the role of personal efficacy, attributes and motivation in preparation and test success; (2) differences in characteristics between high, medium and low performers on the tests; (3) perceptions and attributes of individuals failing a licensure test more than once; and (4) specific aspects of mentoring and other field experiences that promote licensure test success, beyond just the context of traditional practicum v. alternate route teaching. In addition, the study of links between test performance and performance in the classroom is needed, as well as the link between candidate classroom performance and K-12 student learning.

From the consensus among focus group participants, the main source of knowledge needed as a special educator comes from the field experiences. Given the

limited research in this area to date, particular areas for further study include mentoring, supervision and clinical features as a program of research over time. Questions include (1) the nature of interactions between local mentor and candidate that lead to candidate effectiveness; (2) level of intensity of local mentoring needed for best classroom performance; (3) effective methods for providing feedback, both face-to-face and through technology; (4) perceived needs and performance of candidates from candidate, mentor and college supervisor perspectives; and (5) relative effectiveness of different field experience models.

In conclusion, the findings from the current study on knowledge of special education and teaching practices provide some insights into issues in the field as well as institution-specific recommendations. Further, the findings lead to future research areas particularly focused on applications of knowledge and the field experience.

Appendix A

Permission to Use Georgetown College Data

GEORGETOWN
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December 7, 2010

To: University of Kentucky IRB

Georgetown College is in agreement that Debbie Schumacher, co-director for the Learning and Behavior Disorders (LBD) program in the Education Department, may conduct her dissertation study here, entitled Special Education Teacher Preparation: An Ecological Approach to Professional Knowledge of Special Education and Teaching Practices.

Ms. Schumacher has the approval of the Georgetown College IRB for the research, given that the subjects for the study are current students and graduates of our LBD Program. Specifically, our Registrar has indicated that there is no FERPA issue because the student data are already collected and will not be reported in personally identifiable ways. All student data are housed in secure electronic files, and there will be a separate, secured code list of students to avoid association with the student's college ID number.

In addition, protections are in place to assure that the current and graduated students who choose to participate in the focus groups will be contacted and invited to participate by someone who is trained in protection of human subjects and has no interest in the nature of the results, to avoid any coercion or pressure. UK personnel will be used to facilitate the focus groups to allow open expression of opinions.

While the research is being conducted as a dissertation study through UK, we look forward to using the results in our program improvement efforts here at the College.

Sincerely yours,

Dr. Rosemary A. Allen
Professor of English and
Provost/Dean of the College
Georgetown College
Georgetown, KY

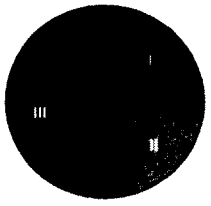
Appendix B

Educational Testing Services Test at a Glance, Praxis Test #0353

ETS THE PRAXIS SERIES™

Listening. Learning. Leading.®

Education of Exceptional Students: Core Content Knowledge (0353)

Test at a Glance			
Test Name	Education of Exceptional Students: Core Content Knowledge		
Test Code	0353		
Time	1 hour		
Number of Questions	60		
Format	Multiple-choice questions		
	Content Categories	Approximate Number of Questions	Approximate Percentage of Examination
	I. Understanding Exceptionalities	15–18	25–30%
	II. Legal and Societal Issues	9–12	15–20%
	III. Delivery of Services to Students with Disabilities	30–36	50–60%

About This Test

The Education of Exceptional Students: Core Content Knowledge test is designed for examinees who plan to teach in a special education program at any grade level from preschool through grade 12. The 60 multiple-choice questions assess the examinee's knowledge of the basic principles of special education, focusing on three major content areas: Understanding Exceptionalities, Legal and Societal Issues, and Delivery of Services to Students with Disabilities. Questions may address disabilities of any degree varying from mild to profound, but extensive knowledge of individual specialty areas, such as education of students with low vision or hearing loss, is not required.

This test may contain some questions that will not count toward your score.

Topics Covered

Descriptions of each of the content areas covered by the test are provided below. For each content area, the approximate percentage of examination questions pertaining to that area is shown. Not every subtopic in a given content area appears on any one form of the test, but every form of the test contains questions on a broad range of subtopics.

I. Understanding Exceptionalities

- Human development and behavior as related to students with disabilities, including
  - Social and emotional development and behavior
  - language development and behavior
  - cognition
  - physical development, including motor and sensory
- Characteristics of students with disabilities, including the influence of
  - cognitive factors
  - affective and social-adaptive factors, including cultural, linguistic, gender, and socioeconomic factors
  - genetic, medical, motor, sensory, and chronological age factors
- Basic concepts in special education, including
  - definitions of all major categories and specific disabilities, as well as the incidence and prevalence of various types of disabilities
  - the causation and prevention of disability
  - the nature of behaviors, including frequency, duration, intensity, and degrees of severity
  - the classification of students with disabilities; labeling of students; ADHD; the implications of the classification process for the persons classified, etc.
  - the influence of level of severity and presence of multiple exceptionalities on students with disabilities
- The influence of (an) exceptional condition(s) throughout an individual's life span

II. Legal and Societal Issues

- Federal laws and legal issues related to special education, including
  - IDEA 2004
  - Section 504
  - Americans with Disabilities Act (ADA)
  - Important legal issues, such as those raised by the following cases: *Rowley* re: program appropriateness, *Tatro* re: related services, *Honig* re: discipline, *Oberti* re: inclusion
- The school's connections with the families, prospective and actual employers, and communities of students with disabilities; for example:
  - teacher advocacy for students and families, developing student self-advocacy
  - parent partnerships and roles
  - public attitudes toward individuals with disabilities
  - cultural and community influences on public attitudes toward individuals with disabilities
  - interagency agreements
  - cooperative nature of the transition planning process
- Historical movements/trends affecting the connections between special education and the larger society; for example:
  - deinstitutionalization and community-based placements
  - inclusion
  - application of technology
  - transition
  - advocacy
  - accountability and meeting educational standards

III. Delivery of Services to Students with Disabilities

- Background knowledge, including
  - conceptual approaches underlying service delivery to students with disabilities, including cognitive, constructivist, psychodynamic, behavioral, sociological, ecological, therapeutic (speech/language, physical, and occupational), and medical approaches
  - placement and program issues such as early intervention; least restrictive environment; inclusion; role of Individualized Education Program (IEP) team; due process guidelines; categorical, noncategorical, and cross-categorical programs; continuum of educational and related services; related services and their integration into the classroom, including roles of other professionals; accommodations, including access to assistive technology; transition of students into and within special education placements; community-based training; postschool transitions
  - integrating best practices from multidisciplinary research and professional literature into the educational setting
- Curriculum and instruction and their implementation across the continuum of educational placements, including
  - the Individualized Family Service Plan (IFSP)/Individualized Education Program (IEP) process
  - Instructional development and implementation; for example: instructional activities, curricular materials and resources, working with classroom and support personnel, tutoring options
  - teaching strategies and methods; for example: modification of materials and equipment, learning centers, facilitated groups, study skills groups, self-management, cooperative learning, diagnostic-prescriptive method, modeling, skill drill, guided practice, concept generalization, learning strategy instruction, and direct instruction
  - instructional format and components; for example: small- and large-group instruction, facilitated group strategies, functional academics, general academics with focus on special education, ESL and limited English proficiency, language and literacy acquisition, self-care and daily living skills, prevocational and vocational skills
  - career development and transition issues as related to curriculum design and implementation for students with disabilities according to the criteria of ultimate functioning
  - technology for teaching and learning in special education settings; for example: integrating assistive technology into the classroom; computer-assisted instruction; augmentative and alternative communication; adaptive access for microcomputers; positioning and power mobility for students with physical disabilities; accessing and using information technology; use of productivity tools; technology for sensory disabilities; and voice-activated, speech-synthesis, speech-recognition, and word-prediction software
- Assessment, including
  - use of assessment for screening, diagnosis, placement, and the making of instructional decisions; for example: how to select and conduct nondiscriminatory and appropriate assessments; how to interpret standardized and specialized assessment results; how to use evaluation results effectively in development of an Individualized Family Service Plan (IFSP)/Individualized Education Program (IEP); how to prepare written reports and communicate findings
  - procedures and test materials, both formal and informal, typically used for prereferral, referral, eligibility, placement, and ongoing program monitoring
  - how to select, construct, conduct, and modify nondiscriminatory, developmentally and chronologically age-appropriate informal assessments, including teacher-made tests, curriculum-based assessment, and alternatives to norm-referenced testing (including observation, anecdotal records, error analysis, miscue analysis, self-evaluation questionnaires and interviews, journals and learning logs, portfolio assessment)

- Structuring and managing the learning environment, including
  - structuring the learning environment; for example: the physical-social environment for learning (expectations, rules, consequences, consistency, attitudes, lighting, acoustic characteristics, seating, access, safety provisions, and strategies for positive interactions); transitions between lessons and activities; grouping of students; integration of related services (occupational therapy, physical therapy, speech and language therapy)
  - classroom management techniques; for example: behavioral analysis (identification and definition of antecedents, target behavior, and consequent events); behavioral interventions; functional analysis; data-gathering procedures (such as anecdotal data, frequency methods, and interval methods); self-management strategies and reinforcement; cognitive-behavioral interventions; social skills training;
  - behavior management strategies
- Professional roles, including
  - specific roles and responsibilities of teachers; for example: teacher as a collaborator with other teachers, teacher educators, parents, community groups, and outside agencies; teacher as a multidisciplinary team member; maintaining effective and efficient documentation; selecting appropriate environments and services for students; critical evaluation and use of professional literature and organizations; reflecting on one's own teaching; teacher's role in a variety of teaching settings (self-contained classroom, resource room, itinerant, co-teacher in inclusion setting, etc.); and maintaining student confidentiality
  - influence of teacher attitudes, values and behaviors on the learning of exceptional students
  - communicating with parents, guardians and appropriate community collaborators; for example: directing parents and guardians to parent-educators or to other groups and resources; writing reports directly to parents; meeting with parents to discuss student concerns, progress, and IEP's; encouraging parent participation; reciprocal communication and training with other service providers

Sample Test Questions

The sample questions that follow illustrate the kinds of questions on the test. They are not, however, representative of the entire scope of the test in either content or difficulty. Answers with explanations follow the questions.

Directions: Each of the questions or incomplete statements below is followed by four suggested answers or completions. Select the one that is best in each case.

Note: In the sample questions and answers, the 2004 amendments to the Individuals with Disabilities Education Act will be referred to as IDEA 2004. An Individualized Education Program will be referred to as an IEP.

1. Which of the following is an accurate statement about what IDEA requires for any IEP?
   (A) The IEP must include a multiyear outline of instructional objectives.
   (B) The IEP must include a section on assistive devices, regardless of the nature or degree of the student's disability.
   (C) The IEP must be in effect before special education services or related services are provided.
   (D) The IEP must not be made available to any school personnel except special education teachers.

2. Michael, a high school student with a learning disability, receives resource-room instruction in English. Michael's parents have requested a conference with the resource-room teacher two months after the start of the school year to discuss his progress in writing. Which of the following would be the most appropriate item for the teacher's agenda for this meeting?
   (A) Ask the parents to compare Michael's written work with that of another student.
   (B) Ask the parents to propose new instructional objectives for the written-expression section of Michael's IEP.
   (C) Offer a comparison of Michael's recent grades on writing assignments with his achievement-test scores from the previous year.
   (D) Show the parents a folder of Michael's written work, and discuss apparent strengths and weaknesses.

3. As an intervention, response cost is best suited for which of the following purposes?
   (A) Improving students' understanding of directions
   (B) Increasing the speed of performance in mathematics
   (C) Decreasing the incidence of angry outbursts
   (D) Decreasing excessive competitiveness among students

4. Which of the following is a nondegenerative disorder that affects motor function as a result of brain injury that occurred before, during, or shortly after birth?
   (A) Multiple sclerosis
   (B) Cerebral palsy
   (C) Muscular dystrophy
   (D) Cystic fibrosis

5. Under the provisions of IDEA, an Individualized Family Service Plan (IFSP) for a 2-year-old child will most probably include
   (A) a budget for early-intervention services
   (B) plans for making the transition into preschool
   (C) techniques for the family to use in introducing academic subjects
   (D) a recommendation of counseling for the child's siblings

6. In inclusion settings, the most appropriate role for the special education teacher is to
   (A) co-teach with the general education teacher
   (B) serve as an instructional assistant to the general education teacher
   (C) observe the general education teacher at regular intervals and write formal evaluations of the teacher for the principal
   (D) manage the behavior of the students receiving special education while the general education teacher presents academic content

7. Which of the following statements best defines the ecological perspective on emotional and behavioral disorders?
   (A) Poisons in the physical environment cause emotional and behavioral disorders.
   (B) Emotional and behavioral disorders involve interactions between the child and the child's social environment.
   (C) Children with emotional and behavioral disorders need exposure to an ever-broadening social environment.
   (D) Inclusion settings are less beneficial for students with emotional and behavioral disorders than for students with other types of disabilities.

8. Which of the following approaches ensures that teachers do not mistake exceptionality for ethnicity?
   (A) Acknowledging different cultural perspectives
   (B) Assuming all individuals in a particular cultural group will act the same
   (C) Demonstrating an attitude of openness toward other cultural groups
   (D) Interpreting all behavior on the basis of norms for the dominant cultural group

9. Which of the following is the basic rationale for using task analysis in instructing students with disabilities?
   (A) Instruction is delivered in steps that are easily achievable and that promote student success.
   (B) Students can eventually learn to analyze assigned tasks themselves.
   (C) Students learn classification skills by identifying similar aspects of different kinds of tasks.
   (D) Instruction can be delivered effectively to many students at once without need for individualization.

10. Mary is a seventh-grade student who has a learning disability. She attends a large school that groups students by demonstrated ability. Her mathematics achievement score indicates that she has a stanine of 9. Which of the following mathematics classes would most probably be appropriate for Mary?
    (A) Remedial mathematics
    (B) Functional mathematics
    (C) Standard mathematics
    (D) Advanced mathematics

11. Mustafa is a 5-year-old who has been assessed and found to have a mild expressive language delay. His hearing is normal, and his functioning in all areas other than expressive language is age appropriate. The placement that would be most appropriate for Mustafa is probably
    (A) a self-contained special education class with speech and language services
    (B) part-time placement in a resource room for mathematics and reading
    (C) full-time general education placement with speech and language services
    (D) full-time general education placement with mathematics and reading support

Directions: The question below differs from the preceding questions in that it contains the word NOT. So that you understand fully the basis that is to be used in selecting the answer, be sure to read the question carefully.

12. IDEA 2004 does NOT include specific provisions for students who have been identified as having
    (A) autism
    (B) language impairments
    (C) multiple disabilities
    (D) attention deficit disorder

Answers

1. The correct answer is C. According to IDEA, an IEP must be in effect before special education and related services are provided to an eligible student. None of the other choices is required. The objectives in an IEP are ordinarily for a single year, so A is not correct. B is not the correct answer because what IDEA requires is that an IEP include a statement of the services and aids to be provided to the child. For some students with disabilities, this will include assistive devices, but many students with disabilities do not require such devices. Although special education teachers certainly have access to their students' IEP's, IDEA requires that regular education teachers and other service providers who are responsible for implementing a student's IEP have access to it as well, so D is not the correct answer.

2. The correct answer is D. Of the choices given, discussing examples of Michael's work best addresses the purpose of the meeting. Asking parents to compare their child's work with that of another student, as in choice OR answer choice A, is not appropriate. B is not correct because the conference is not an IEP meeting, and because, while the parents have input into their child's IEP, it is not appropriate for the teacher to ask parents to propose objectives. C is not correct because the comparison it suggests is unlikely to be informative.

3. The correct answer is C. Response cost needs to be tied to the occurrence of a specific, observable behavior. Only C meets this criterion.

4. The correct answer is B. None of the other conditions occurs as a result of brain injury.

5. IDEA requires that an IFSP include plans for the transition to preschool, so B is the best answer. IFSP's do not include budgets, so A is not the correct answer. The techniques and recommendation cited in choices C and D are optional in an IFSP, but, unlike the transition plan mentioned in B, they are not required by IDEA.

6. The correct answer is A. In inclusion settings, an appropriate role for the special education teacher is as a co-teacher with the general education teacher. The special education teacher should not be the assistant to the general education teacher, so B is not correct. While the special education teacher may observe the general education teacher and offer recommendations on working with classified students, this is done in the role of collaborating professional, not in the role of evaluator, so C is not correct. D is not correct because, although the special education teacher may have primary responsibility for behavior management with certain special education students, the teachers should share responsibility for both behavior management and academic content.

7. B is the correct answer. The ecological perspective emphasizes the importance of interactions between the child and the child's environment in emotional and behavioral disorders. A is not correct; the ecological perspective on emotional and behavioral disorders does not refer to the influence of toxins in the physical environment. Neither C nor D defines this perspective.

8. A is the correct answer. Culture is the way in which each person is socialized from infancy to perceive and interpret what is happening and to determine the appropriate way to behave. Acknowledging those differences A allows a teacher to take into account a student's cultural background. B is incorrect because a student's culture consists of a broad range of characteristics not necessarily attributed to stereotypical notions. C Simply demonstrating an attitude of openness does not indicate that the teacher will be able to differentiate between behaviors and disabilities. D is not correct because the student may belong to a different cultural group than the dominant one and thereby exhibit behaviors that are different.

9. A is the correct answer. It provides two key justifications for the use of task analysis. B is incorrect because, although the skill it describes is a possible benefit of using task analysis, it is not the basic rationale for the use of task analysis. C is not correct because the learning of classification skills is not a primary objective of task analysis. D is not correct because individualization of instruction is always important in instructing students with disabilities.

10. The correct answer is D because Mary's achievement score indicates high mathematical ability; 9 is the highest possible stanine score. On the basis of the information presented, the most appropriate placement is the advanced class. None of the other choices is appropriate to her high mathematical ability. Despite her learning disabilities, it is entirely possible that she could, perhaps with support, undertake an advanced class in an area of strength.

11. The best answer is C. Since Mustafa's functioning is age appropriate in most respects, it is probable that he could work at the level of the class in a general education setting as long as he is provided with appropriate support services to address his expressive language deficit. There is no clear justification for a full-time special education setting, as in choice A, as the initial placement for a young child with a very specific expressive language delay and no other disability. There is no evidence that Mustafa needs support for either mathematics or reading, so B and D are not correct.

12. The correct answer is D. IDEA 2004 makes provision for students who are classified as autistic, A. In B, those students who have a language impairment receive services under the classification of communication handicapped. Students who have multiple disabilities can receive services under the classification of severe and multiple disabilities. D is the only disability indicated that does not have a specific provision. IDEA 2004 does not specifically address attention deficit disorder (ADD); however, students who are diagnosed with ADD can receive services under the classification of "other health impaired."

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Appendix C

Educational Testing Services Test at a Glance, Praxis Test #0542

THE PRAXIS SERIES™

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Education of Exceptional Students: Mild to Moderate Disabilities (0542)

Test at a Glance			
Test Name	**Education of Exceptional Students: Mild to Moderate Disabilities**		
Test Code	**0542**		
Time	**1 hour**		
Number of Questions	**5 constructed-response questions**		
Format	**Questions requiring the application of special education knowledge to teaching situations**		
	Content Categories	Number of Questions	Percentage of Total Score
	I. Assessment	1–2	25–42%
	II. Curriculum and Instruction	1–2	25–42%
	III. Structuring and Managing the Learning Environment	1–2	25–42%

About This Test

The Education of Exceptional Students: Mild to Moderate Disabilities test is designed for examinees who plan to teach in a special education program for students with mild to moderate disabilities at any grade level from preschool through grade 12. The constructed-response questions assess the examinee's ability to apply the principles of special education to situations that a teacher is likely to encounter in teaching students with mild to moderate disabilities.

Topics Covered

I. Assessment

- Demonstrate knowledge of specialized policies regarding screening, pre-referral strategies, referral, and placement procedures for individuals with mild to moderate disabilities
- Demonstrate knowledge of assessment for eligibility: instruments and methods, both formal and informal (e.g., ecological inventories; portfolio, functional, and assistive-technology assessments) used to determine eligibility for special education services, with consideration given to
  - modality preferences
  - levels of support and/or independence
  - accommodations for test-taking situations
  - cultural and linguistic diversity
- Demonstrate knowledge of assessment for instruction:
  - how to design and adapt assessments, both formal and informal, to use in developing instruction for individuals with mild to moderate disabilities, with consideration given to
    - modality preferences
    - levels of support and/or independence
    - accommodations in test-taking situations
    - cultural and linguistic diversity
  - how to utilize assessment information in developing instruction for individuals with mild to moderate disabilities in both specialized and general-education settings in both
    - academic domains (e.g., mathematics, reading, writing, social studies, science, art, music, vocational) and
    - behavioral domains (e.g., social skills, listening skills, communication skills, self-management skills, pre-vocational skills)

II. Curriculum and Instruction

- Demonstrate knowledge of how to evaluate, select, and develop curriculum materials appropriate for individuals with mild to moderate disabilities, with sensitivity to cultural and linguistic diversity and adaptations and accommodations for individuals with mild to moderate disabilities
- Demonstrate knowledge of how to use local, community, and state resources to assist in developing programs for individuals who are likely to make progress in the general curriculum
- Demonstrate knowledge of how to write appropriate IEP goals and objectives for students with mild to moderate disabilities in
  - academic domains (including vocational)
  - behavioral domains
- Demonstrate knowledge of how to plan instruction based on IEP's, including developing appropriate lesson plans for individuals and groups with mild to moderate disabilities, in
  - academic domains (including vocational)
  - behavioral domains

III. Structuring and Managing the Learning Environment

- Demonstrate knowledge of behavior management
  - how to implement systematic behavior management plans, using
    - observation
    - recording
    - charting
    - establishment of timelines
    - hierarchies of interventions
    - schedules of reinforcement
  - how to select target behaviors to be changed and identify the critical variables affecting the target behavior
- Demonstrate knowledge of problem-solving and conflict resolution
- Demonstrate knowledge of how to integrate related services into the instructional settings of students with mild to moderate disabilities
- Demonstrate knowledge of how to collaborate with others (including both personnel and families) in planning and providing instruction for students with mild to moderate disabilities

Sample Test Questions

This section presents sample questions and sample responses along with the standards used in scoring the responses. When you read these sample responses, keep in mind that they will be less polished than if they had been developed at home, edited, and carefully presented. The examinee does not know what questions will be asked and must decide, on the spot, how to respond. Readers take these circumstances into account when scoring the responses. Readers will assign scores based on the following scoring guide.

SCORING GUIDE

3

Demonstrates a thorough understanding of the topic
- Shows a thorough understanding of the most significant aspects of any stimulus material presented
- Responds appropriately to all parts of the question
- Where an explanation is required, provides a strong explanation that is well supported by relevant evidence
- Demonstrates a strong knowledge of subject matter, concepts, theories, facts, procedures, or methodologies relevant to the question

2

Demonstrates a basic understanding of the topic
- Shows a basic understanding of the most significant aspects of any stimulus material presented
- Responds appropriately to most parts of the question
- Where an explanation is required, provides an explanation that is sufficiently supported by relevant evidence
- Demonstrates a sufficient knowledge of subject matter, concepts, theories, facts, procedures, or methodologies relevant to the question

1

Demonstrates a lack of understanding of the topic
- Shows a lack of understanding or misunderstanding of the most significant aspects of any stimulus material presented
- Fails to respond appropriately to most parts of the question
- Where an explanation is required, provides a weak explanation that is not well supported by relevant evidence
- Demonstrates a weak knowledge of subject matter, concepts, theories, facts, procedures, or methodologies relevant to the question

0

This score is reserved for blank papers, off-topic or completely inaccurate responses, or responses that merely rephrase the question.

Directions: Two constructed-response questions follow. CAREFULLY READ AND FOLLOW THE SPECIFIC DIRECTIONS FOR EACH QUESTION. If the question has more than one part, be sure to answer each part of the question. At a test administration, you will write your answers to constructed-response questions in the space provided in the answer book.

Question 1 (Suggested time—15 minutes)

Teaching Scenario

By mid-October, Catherine's third grade teacher has become concerned because Catherine has great difficulty reading grade-level materials. Her written work is largely illegible and contains sentence fragments and numerous spelling errors. Catherine does not initiate conversations, does not make eye contact, and never raises her hand to volunteer in class. Catherine does perform well on some math work that does not require interactions with other children or adults. The teacher has decided to refer Catherine for a special education evaluation.

Task

1. List THREE types of data that the teacher should collect PRIOR to making a referral.
2. Explain the value of collecting each of these types of data. In your explanation, be sure to relate the types of data to Catherine's reading, writing, and social behavior.

Sample Response That Received a Score of 3:

Types of data:

1. anecdotal info concerning social interactions
2. writing sample
3. reading evaluation - IRI to determine reading level

Explanation of value

1. Catherine is not socializing appropriately in the classroom. Anecdotal info must be collected to evaluate Catherine's behavior in a variety of situations such as the playground, cafeteria, gym class. A checklist could be used to measure Catherine's behavior in these situations. Field notes could also be gathered and used to discuss Catherine's behavior.
2. Writing samples should be analyzed to see patterns in Catherine's spelling errors - i.e., does she need help with CVCe words, CVC words, etc. An analysis of the writing samples would also show Catherine's use of fragments vs. whole sentences.
3. Catherine may be uncomfortable in class because of a low reading level. An Informal Reading Inventory could be used to determine Catherine's reading level. The IRI could also show problems with decoding that could be related to Catherine's poor spelling ability.

Sample Response That Received a Score of 1:

Types of data:

writing sample
running records

Explanation of value

It is important to collect a writing sample b/c it allows the teach to examine growth in a child's writing and the child's strength's & weaknesses. It is also helpful in making a referral to an occupational therapist. It also the teacher to examine if common errors are repeating in writing.

Question 2 (Suggested time—15 minutes)

Teaching Scenario

Pete, age 12, has been diagnosed with a mild cognitive impairment and placed in a general fifth-grade class with in-class support from a special education teacher. Pete is able to identify individual coins and their values, but when given a group of mixed coins with different values, he is unable to calculate their total value, either mentally or with paper and pencil.

Task

Design a lesson plan that the special education teacher can use to help Pete acquire the ability to calculate the value of a group of mixed coins, on paper. Include in your answer

- a measurable objective;
- step-by-step teaching/learning procedures using direct instruction method; and
- an evaluation procedure that will demonstrate that the objective has been met.

Sample Response That Received a Score of 3:

Objective:

- Pete will be able to identify groups of coins with different values.
- Pete will learn to use a calculator to calculate coin values.
- Pete will be able to identify groups of coins using textual cues which will be systematically faded.
- Pete will be able to make purchases in a makeshift candy store with his coins.

Procedure:

Intro

- Review of individual coins (identification/value)
- Game introduced to review coin value.

Dev. Activity

- Textual cues (i.e., 5¢) placed on coins. Begin by adding 2 different coins together. (i.e., 5¢ + 10¢ =) (A calculator will be introduced to assist with calculations.)
- Systematically introduce an extra coin to the sequence (i.e., 5¢ + 10¢ + 25¢ = ____)
- Textual cues (labels on coins) will be faded.
- Calculator can still be used.

Evaluation:

- A makeshift candy store in the classroom will be introduced. Pete will be able to make purchases. (Calculator can be used)
- Once Pete has made acquisition on adding the values of his coins, textual cues on the coins can be faded.
- Probe to see if Pete has maintained the value/ identification of the coins.
- Evaluate by asking Pete for specific amounts of money.
- Allow him to make purchases independently vary the amts. that each item is sold for.
- Incorporate this skill into next lesson/community

Sample Response That Received a Score of 1:

Objective:

Pete must recognize individual coins and add each type 80%

Procedure:

Give Pete piles of each type to work with and a peer

Evaluation:

Set up a coin machine to see if Pete can match the coins and fit each type into the machine. Can he add up each type?

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Appendix D

Georgetown College Institutional Review Board Approval

GEORGETOWN
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DATE: December 6, 2010

TO: Deborah Schumacher

FROM: Andrea Peach, Associate Professor of Graduate Education

RE: Institutional Review Board (IRB) Proposal

A determination has been made that the following research study is **approved** by the Institutional Review Board (IRB) at Georgetown College:

Category 2 – Expedited: Research on group or individual behavior or characteristics or behavior (including, but not limited to research on perception, cognition, motivation, communication, cultural beliefs, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Project Title: Special Education Teacher Preparation: An Ecological Approach to Professional Knowledge of Special Education and Teaching Practices

Project Director: Deborah Schumacher

Department: Graduate Education

Andrea C. Peach

Dr. Andrea C. Peach, Chair
Institutional Review Board

Appendix E

University of Kentucky Institutional Review Board Consent Form

IRB Approval
10-0918
THIS FORM VALID
2/23/11 – 2/22/12

Consent to Participate in a Research Study

Special Education Teacher Preparation: An Ecological Approach

To Professional Knowledge of Special Education and Teaching Practices

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being invited to take part in a research study about professional knowledge of current students and graduates of the Georgetown College LBD Program. Specifically, we are conducting several small focus groups of current students and graduates to explore what knowledge students see as important in the classroom and how this knowledge developed for them during the program. If you volunteer to take part in the focus group study, you will be one of about 24 people to do so.

WHO IS DOING THE STUDY?

The person in charge of this study is Debbie Schumacher, who is a doctoral student in the University of Kentucky Department of Special Education. She is being guided in this research by Dr. Robert McKenzie, doctoral advisor.

WHAT IS THE PURPOSE OF THIS STUDY?

The overall purpose of the research is to investigate how Georgetown College students' pre-LBD program background, types of field experiences during the program, course work sequence, and mentored experiences affect their development of professional knowledge of special education and teaching practices. A separate study of existing Georgetown LBD program data 2007-2010 will occur. The focus group study will help us learn what students and graduates believe about professional knowledge in LBD to make recommendations to improve the program.

ARE THERE REASONS WHY YOU SHOULD NOT TAKE PART IN THIS STUDY?

You may wish to decline participation if the scheduled focus group time is inconvenient, or if you have any concerns about participation or pressure to express particular opinions.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The focus group will be conducted online through a desktop audio conference (small group webinar) on Saturday,_____ at _____. You will need to log into the provided web link approximately 10-15 minutes before the group will start. The webinar will last approximately one hour. After the webinar, you will be asked to review a written summary of comments from the focus group to validate the content prior to its use in the study. No one from the LBD Program will be present at the webinar or have access to the archived record. Participant comments will be transcribed by an outside party, and individual comments will not be personally attributed to you or any other participant.

WHAT WILL YOU BE ASKED TO DO?

You are being asked to share your experiences and opinions during the webinar, as these relate to professional knowledge. To participate, you will need Internet access and a headset. If you need a headset, one will be provided at no cost to you.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

To the best of our knowledge, the things you will be doing have no more risk of harm than you would experience in everyday life.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

You will not get any personal benefit from taking part in this study.

DO YOU HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering. If you are a current student, if you decide not to take part in this study, your choice will have no effect on you academic status or grade in any class.

IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST YOU TO PARTICIPATE?

There are no costs associated with taking part in the study.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

You will not receive any rewards or payment for taking part in the study.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be personally identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

Coordination of your participation will be through someone who is not affiliated with the LBD Program, and an external moderator will conduct the focus group. We will make every effort to prevent faculty from the LBD Program, including the principal investigator and anyone who is not on the research team from knowing that you participated, gave us information, or what that information was. The webinar will be temporarily archived in order to prepare a transcription without identification of individual speakers. Then the archived webinar will be deleted. The transcription without speaker names will be used to prepare a written summary of comments, which you will have the opportunity to review before it is used in the study.

We will keep private all research records that identify you to the extent allowed by law. However, there are some circumstances in which we may have to show your information to other people. We may be required to show information which identifies you to people who need to be sure we have done the research correctly; these would be people from such organizations as the University of Kentucky.

CAN YOUR TAKING PART IN THE STUDY END EARLY?

If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop taking part in the study.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study, you can contact the investigator, Debbie Schumacher at 502-863-7013 or the Georgetown Institutional Research Board Chairperson, Dr. Andrea Peach Andrea_Peach@georgetowncollege.edu. If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-9428 or toll free at 1-866-400-9428. We will give you a signed copy of this consent form to take with you.

WHAT ELSE DO YOU NEED TO KNOW?

Georgetown College administratively supports this study as part of its ongoing program evaluation.

I certify that I have read and fully understand the Statement of Purpose and agree to participate in this research project. My participation is given voluntarily and without coercion or undue influence. I understand that I may discontinue participation at any time without penalty or loss of any benefits to which I might otherwise be entitled. I certify that I am at least eighteen years of age.

_____ _____

Signature of person agreeing to take part in the study — Date

_____

Printed name of person agreeing to take part in the study

Debbie Schumacher — 3-22-2011

Debbie Schumacher, Principal Investigator — Date

Appendix F

Recruitment Materials for Focus Group Participants

Recruitment Initial Email Contact

"Hello --
"I am Donna Whitehouse from Georgetown College. You are being invited to take part in a research study that will help us improve our LBD program. We will be conducting several small focus groups of current LBD students and graduates to learn what knowledge students see as important in the classroom and how this knowledge developed for them during the program. If you volunteer to take part in one of the focus groups, you will be one of about 24 people to do so.

"If you are interested in hearing more about this study, please reply to this email. Also, please include the phone number that you prefer I use.

"Thanks so much for your consideration."

Recruitment Phone Call Follow-up to Initial Email

"Hello. This is Donna Whitehouse from Georgetown College. You are being invited to take part in a research study that will help us improve our LBD program. We will be conducting several small focus groups of current LBD students and graduates to learn what knowledge students see as important in the classroom and how this knowledge developed for them during the program. If you volunteer to take part in one of the focus groups, you will be one of about 24 people to do so. Would you be interested? If so, I can explain more."

If no: "Thank you so much for your time".

If yes: Continue

"The person in charge of this study is Debbie Schumacher, who is completing her doctoral program in the UK Department of Special Education. The overall research will also include reviewing some existing program data.

"The focus group will be conducted online through a desktop audio conference (small group webinar) on Saturday,_____ at _____ and will last approximately one hour. You will be asked to share your experiences and opinions during the webinar, as these relate to professional knowledge. To participate, you will need Internet access and a headset. If you need a headset, one can be provided at no cost to you. Jeanna Mullins, an experienced group facilitator at UK, will be the facilitator. To protect your confidentiality, we will make every effort to prevent faculty from the LBD Program, including Debbie, from knowing that you participated, gave us information, or what that information was. After the webinar, you will be asked to review a information, or what that information was. After the webinar, you will be asked to review a written summary of comments from the focus group to validate the content prior to its use in the study.

"You may wish to decline participation. If you decide to take part in the focus group, it should be because you really want to volunteer. We are really interested in your input! (If you are a current student, if you decide not to take part in this study, your choice will have no effect on your academic status or grade in any class.)

"Your information will be combined with information from other people taking part in the study. You will not be personally identified in any written materials or oral reports. We may publish the results of this study; however, we will keep your name and other identifying information private.

"If you would like to take part, I will email you a written consent form that you need to sign and return by mail before the webinar. It contains more details.
"Do you have any questions right now?

"If you have questions, suggestions, concerns, or complaints about the study, you can contact the investigator, Debbie Schumacher at 502-863-7013 or the Georgetown

Institutional Research Board Chairperson, Dr. Andrea Peach
Andrea_Peach@georgetowncollege.edu."

"Thank you so much for agreeing to participate. I will be sending you the consent form as well as more details about the webinar. We look forward to hearing from you."

Sample Webinar Instructions Emailed to Participants

LBD Focus Group #3

Join us for a Webinar on Saturday, April 16 at 9am. Thank you for participating!

This is a small group discussion about what you need(ed) to know for initial LBD teaching and how you learned that. To participate, you must:

- **Mail in your signed original consent form that you receive in the mail (must be postmarked by April 8),**
- **Advance register following the link below prior to April 9, and**
- **Have a headset with speaker and microphone. The session will be oral. If you do not have a headset, please contact Donna_Whitehouse@georgetowncollege.edu.**

Reserve your Webinar seat now at:
https://www2.gotomeeting.com/register/460254018

Title: ***LBD Focus Group #3***
Date: Saturday, April 16, 2011
Time: 9:00 AM - 10:00 AM EDT

After registering you will receive a confirmation email containing information about joining the Webinar.

System Requirements
PC-based attendees
Required: Windows® 7, Vista, XP or 2003 Server

Macintosh®-based attendees
Required: Mac OS® X 10.4.11 (Tiger®) or newer

Recruitment Email for Phone Interview Instead of Focus Group

"Dear LBD Student/Graduate –

"Many of you that we contacted concerning the LBD Research Study told us that, while you could not participate in the webinar focus groups in April due to scheduling conflicts,

you indicated a willingness to help. We understand what a busy time of year it is for all teachers (especially for those of you who are also students/parents/coaches)!

"To make it easier to have input into the study, we are setting up phone interviews which will be scheduled at your convenience. This interview would only take a few minutes of your time. Your input will significantly benefit the research study and will be greatly appreciated.

"One of our research study facilitators will be contacting you by phone to see when (and if) you are available. In the meantime, I will send each of you a consent form along with a stamped, addressed envelope. When you have read it, please sign, date, and return it to us in the envelope provided.

"Thanks and Blessings!"

Appendix G

Focus Group Facilitation Guide

Moderator Guide

Description

Goals. Focus groups are one part of a study investigating the knowledge of special education and teaching practices of ABC College LBD candidates and graduates. The goals for the focus groups are to:

(1) develop a general understanding of what content and pedagogical knowledge participants perceive as most important to their role as a beginning special educator;

(2) identify sources of knowledge that participants perceive as most important, particularly as related to categories addressed in the two LBD Praxis tests (e.g., assessment, curriculum and intervention, behavior management); and

(3) provide direction for recommendations to improve the program for development of better candidate knowledge of special education and teaching practices.

Participants. A moderator will conduct four focus groups, repeating the same procedures and questions with 2008-2010 LBD candidates and graduates who have been invited to one of the following groups:

1. alternate route LBD teachers with a previous Education background;
2. alternate route LBD teachers without a previous Education background;
3. traditional field experience candidates with a previous Education background; and
4. traditional field experience candidates without a previous Education background.

Each focus group will include five to six individuals, balanced across geographic locations and status (i.e., graduates and current enrollees), for a total of 20-24 interviewees. The intention of the focus group is to generate as much insight as possible on the topic, not to reach consensus within the group. Therefore, it is desirable to have as much variety within the group as possible, while keeping each group homogeneous by background and field experience context. The LBD program faculty will make suggestions for a pool of potential interviewees. However, a person outside the program and with no vested interests in the results will make all contacts before and after the sessions to assure confidentiality and avoid pressure to participate or provide particular recommendations.

Process. The focus group will be conducted through desktop audio conferencing, with a recording made of the conversation. A script has been prepared for the moderator to assure similar format across the sessions. However, after posing the major questions,

the moderator may rephrase or add questions in order to follow up on participant comments.

Product. Each focus group record will be transcribed, with participant names coded. From the transcriptions, the investigator will create a written summary of the detailed comments and suggestions collected during the session. The focus group moderator will review the summary to assure accuracy and validate or clarify points. The revised summary will then be provided to participants to validate or clarify the points.

Once the written summaries are confirmed, the study investigator will analyze the contents for similarities and differences across the groups, as well as themes and patterns. This analysis will be shared with the moderator for validation prior to use in the study results.

Session Script

Introduction

Welcome. Thank you for agreeing to participate in this focus group. My name is (_____). I have been asked to conduct this session because I have experience working with groups, but I am not part of the ABC College LBD program. I also have the assistance of (_____), who is managing the equipment and will be taking notes that you will be able to see on your screen. We'll do a sound check right now as well as make sure that you can see the screen. You have a "hand" icon where you can raise your hand to make a comment if you wish. As a sound check, I would like you to introduce yourselves. Tell us where you teach, or what your plans are. (*Get everyone's brief introduction as a way to conduct check on sound and interaction process).*

Statement of Purpose of the Interview. As noted in your invitation to this session, ABC wants to hear from you about what you believe you most need to know about special education and teaching practices as a beginning special education teacher and how you learned or acquired this knowledge. Your information is part of a dissertation study on this topic and may lead to recommendations for improvements in the ABC program to better support candidates from a variety of backgrounds.

Guidelines to Follow During the Interview. There are a few guidelines to follow today. First, please feel free to speak up when a question has been posed or raise your hand to jump in, but identify yourself until we are able to recognize voices. Second, we are not trying to reach consensus today, but rather hear from different perspectives, so please do not feel that you have to agree with what others say, though you certainly may

agree if that is the case! Third, we will be keeping your individual comments confidential and expect everyone here to do the same. After the session, a transcript will be made of the session, but with your names coded for anonymity. A summary of the comments will be prepared which you will be able to review before it is used for analysis. After the analysis and completion of the study, the audio recording and written transcripts will be destroyed because it will only be used to reliably report your various responses to the questions. Are there any questions at this point? *(Respond to questions.)*

Warm-Up

Let's get started. As a group, you have some similarities in your background, in that your undergraduate program before the Georgetown program (was/was not) in Education and that while you were in the program, you (are/are not) teaching LBD on a Temporary Provisional LBD certificate. (*The background and teaching context will vary based on the focus group).* Please share a little on what led you to pursue being an LBD teacher. (*Responses)*

Thank you. That gives us all a little more about your frame of reference.

Terminology Clarification

Today, we are going to be talking about "professional knowledge" – what a teacher knows about special education and teaching practices.

Question 1

(*Show on screen a visual prompt of the broad categories aligned to Praxis: assessment, curriculum/ instruction, learning environment, disabilities and learner needs, due process/legal procedures, other)* What do you believe you need(ed) to know to begin as an LBD teacher?

(Assistant makes notes)

Were/Are any of (these) most important as you start(ed) in LBD?

(Assistant makes notes)

How well-prepared do you feel for being an LBD teacher?

(Assistant makes notes)

Question 2

(Show on screen a visual prompt of broad categories: coursework (special, general), field experience, mentor, personal reflection, other.) Tell us how you gained this knowledge of special education and teaching practices.

(Assistant makes notes)

Were/are any of these sources or methods most important to you?

(Assistant makes notes)

Question 3

How did you knowledge about these areas change during the program?

(Assistant makes notes)

How confident do you feel in applying this knowledge in the classroom?

(Assistant makes notes)

Question 4

How well did the Praxis testing capture your knowledge about these areas?

(Assistant makes notes)

Question 5

Are there any suggestions that you have for the LBD program to help you learn or acquire this knowledge better?

(Assistant makes notes)

Wrap-Up

Identify Major Themes from Participant Responses. Let me summarize some of your comments .... Does this capture your thinking?

(Assistant makes notes)

Closing. As I mentioned earlier, a summary will be prepared of your comments from this session. It will be emailed to you as a check to make sure that the major thoughts were captured. When you receive it, please review and add in any clarifications. Then return it as soon as possible. The edited summary will be what is shared as part of the dissertation study, with possibly a few anonymous excerpted comments to clarify a point.

Thank you so much for being part of this focus group. Your insights are appreciated!

Appendix H

Participant Praxis Test #0353 Overall and Subtest Scores

Comparison of ETS and ABC College Means for Praxis Test #0353

Minitab Two-Sample T-Test and Confidence Intervals

Sample	N	Mean	StDev	SE Mean
ETS	29565	172.3	14.1	0.082
ABC	506	172.0	13.2	0.59

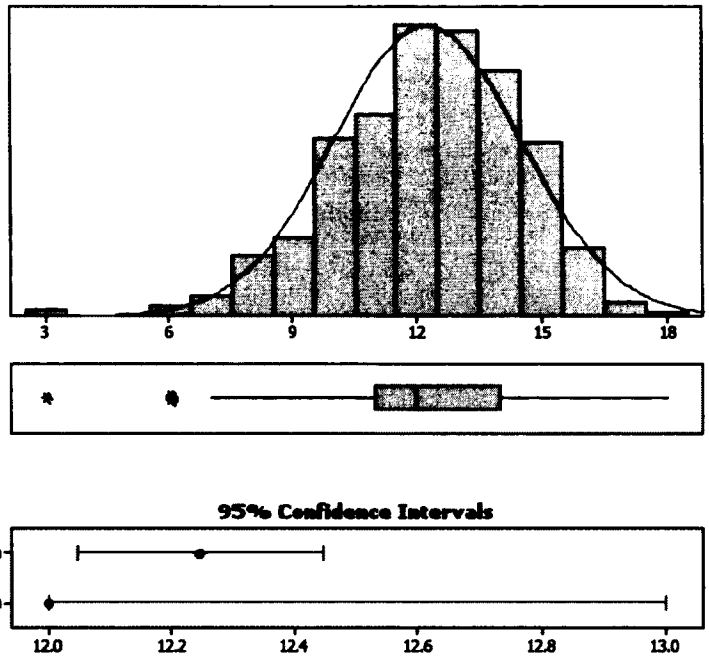
```
Difference = mu (1) - mu (2)
Estimate for difference:  0.300
95% CI for difference:  (-0.864, 1.464)
T-Test of difference = 0 (vs not =): T-Value = 0.51  P-Value = 0.613  DF = 524
```

Minitab Correlation Matrix for the ABC Praxis #0353 Test Scores and the Three Subtest Scores

	353score	353Sub1	353Sub2
353Sub1	0.698		
	0.000		
353Sub2	0.579	0.288	
	0.000	0.000	
353Sub3	0.794	0.368	0.104
	0.000	0.000	0.021

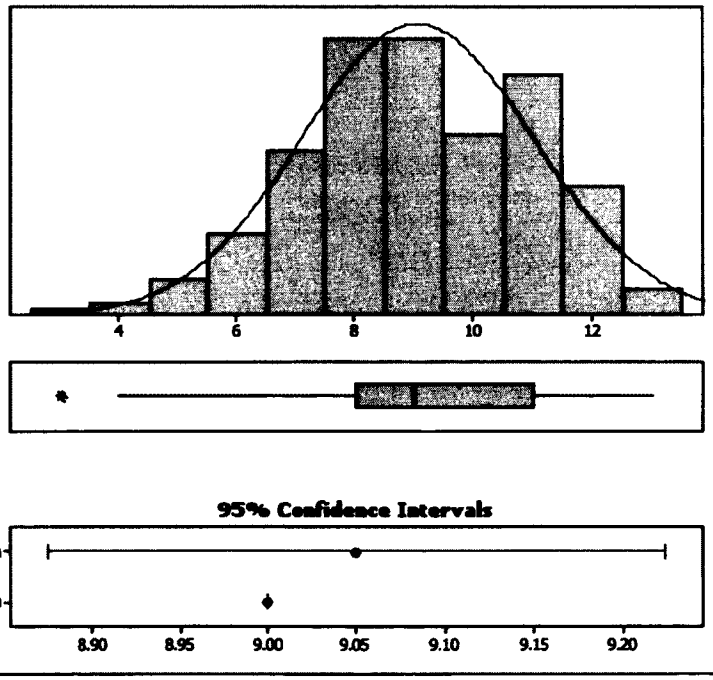
```
Cell Contents: Pearson correlation
               P-Value
```

Summary for Praxis #0353 Subscore 1 Exceptionalities

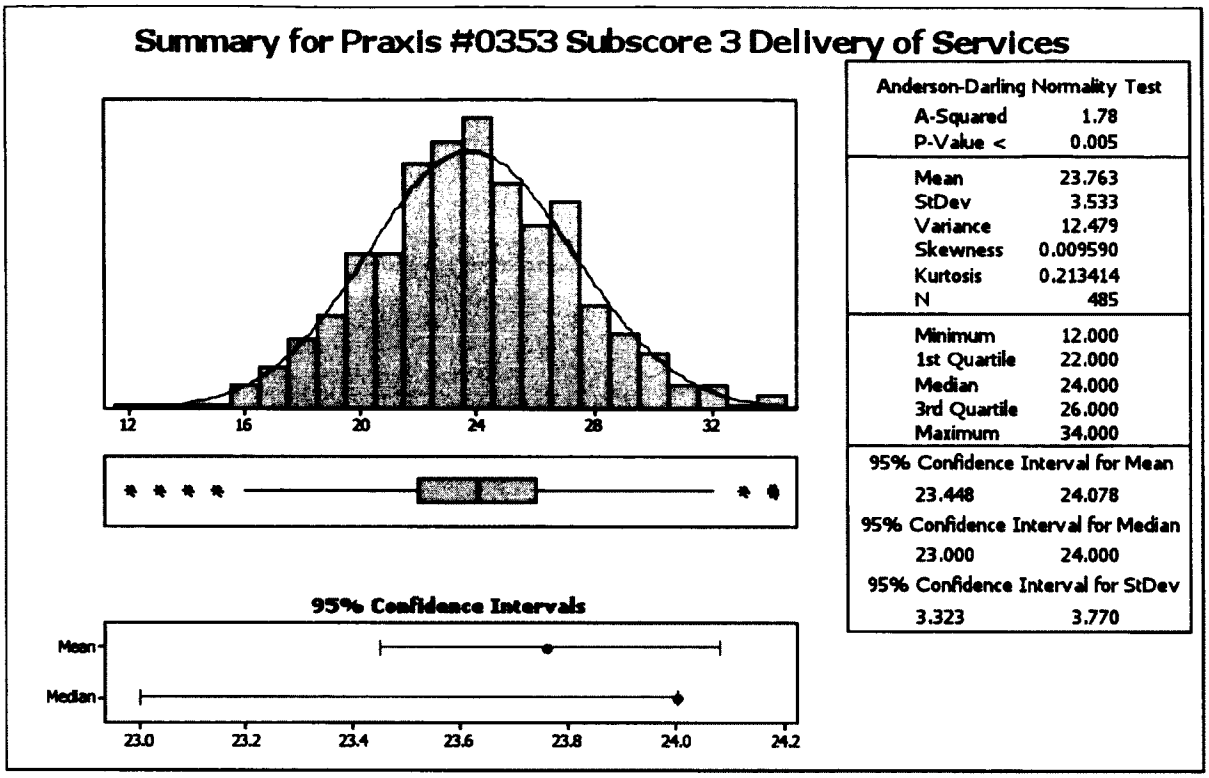


Anderson-Darling Normality Test	
A-Squared	5.21
P-Value <	0.005
Mean	12.246
StDev	2.249
Variance	5.059
Skewness	-0.520942
Kurtosis	0.600099
N	487
Minimum	3.000
1st Quartile	11.000
Median	12.000
3rd Quartile	14.000
Maximum	18.000
95% Confidence Interval for Mean	
12.046	12.447
95% Confidence Interval for Median	
12.000	13.000
95% Confidence Interval for StDev	
2.116	2.400

Summary for Praxis #0353 Subscore 2 Legal Issues



Anderson-Darling Normality Test	
A-Squared	6.48
P-Value <	0.005
Mean	9.0493
StDev	1.9578
Variance	3.8330
Skewness	-0.217912
Kurtosis	-0.353894
N	487
Minimum	3.0000
1st Quartile	8.0000
Median	9.0000
3rd Quartile	11.0000
Maximum	13.0000
95% Confidence Interval for Mean	
8.8750	9.2236
95% Confidence Interval for Median	
9.0000	9.0000
95% Confidence Interval for StDev	
1.8421	2.0891


Summary for Praxis #0353 Subscore 3 Delivery of Services
Anderson-Darling Normality Test
A-Squared 1.78
P-Value < 0.005
Mean 23.763
StDev 3.533
Variance 12.479
Skewness 0.009590
Kurtosis 0.213414
N 485
Minimum 12.000
1st Quartile 22.000
Median 24.000
3rd Quartile 26.000
Maximum 34.000
95% Confidence Interval for Mean
23.448 24.078
95% Confidence Interval for Median
23.000 24.000
95% Confidence Interval for StDev
3.323 3.770
12
16
20
24
28
32
95% Confidence Intervals
Mean
Median
23.0
23.2
23.4
23.6
23.8
24.0
24.2

Appendix I

Participant Praxis Test #0542 Overall and Subtest Scores

Comparison of ETS and ABC College Means for Praxis Test #0542

Minitab Two-Sample T-Test and Confidence Intervals

Sample	N	Mean	StDev	SE Mean
ETS	9835	177.2	11.6	0.12
ABC	382	180.7	10.9	0.56

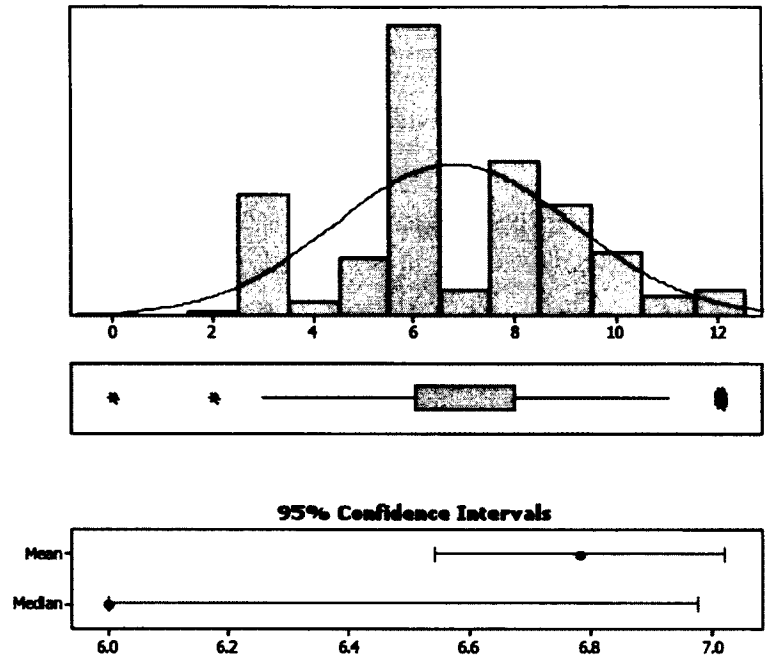
```
Difference = mu (1) - mu (2)
Estimate for difference:  -3.500
95% CI for difference:  (-4.620, -2.380)
T-Test of difference = 0 (vs not =): T-Value = -6.14  P-Value = 0.000  DF = 415
```

Minitab Correlation Matrix for the ABC Praxis #0542 Test Scores and the Three Subtest Scores

	542score	542sub1	542sub 2
542sub1	0.568		
	0.000		
542sub 2	0.631	0.290	
	0.000	0.000	
542sub3	0.489	-0.057	0.054
	0.000	0.268	0.294

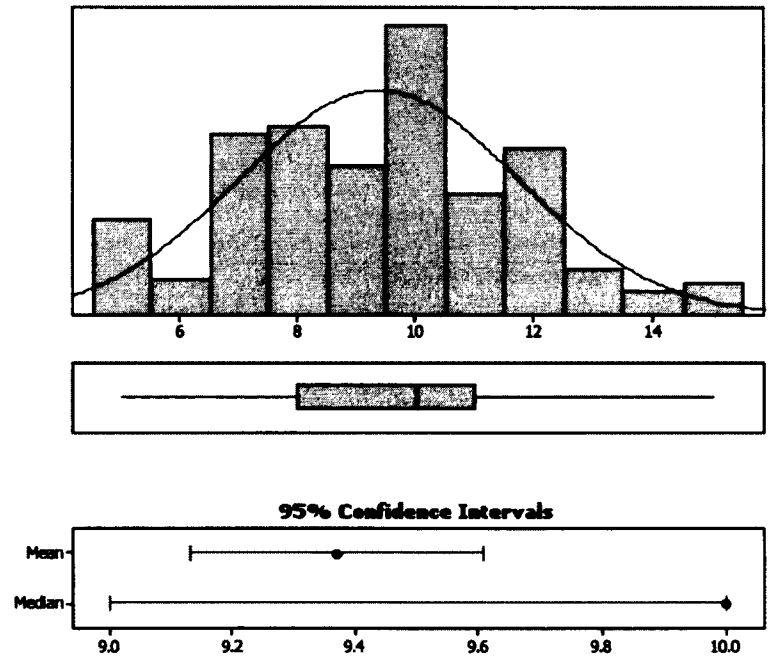
```
Cell Contents: Pearson correlation
               P-Value
```

Summary for Praxis #0542 Subscore 1 Assessment

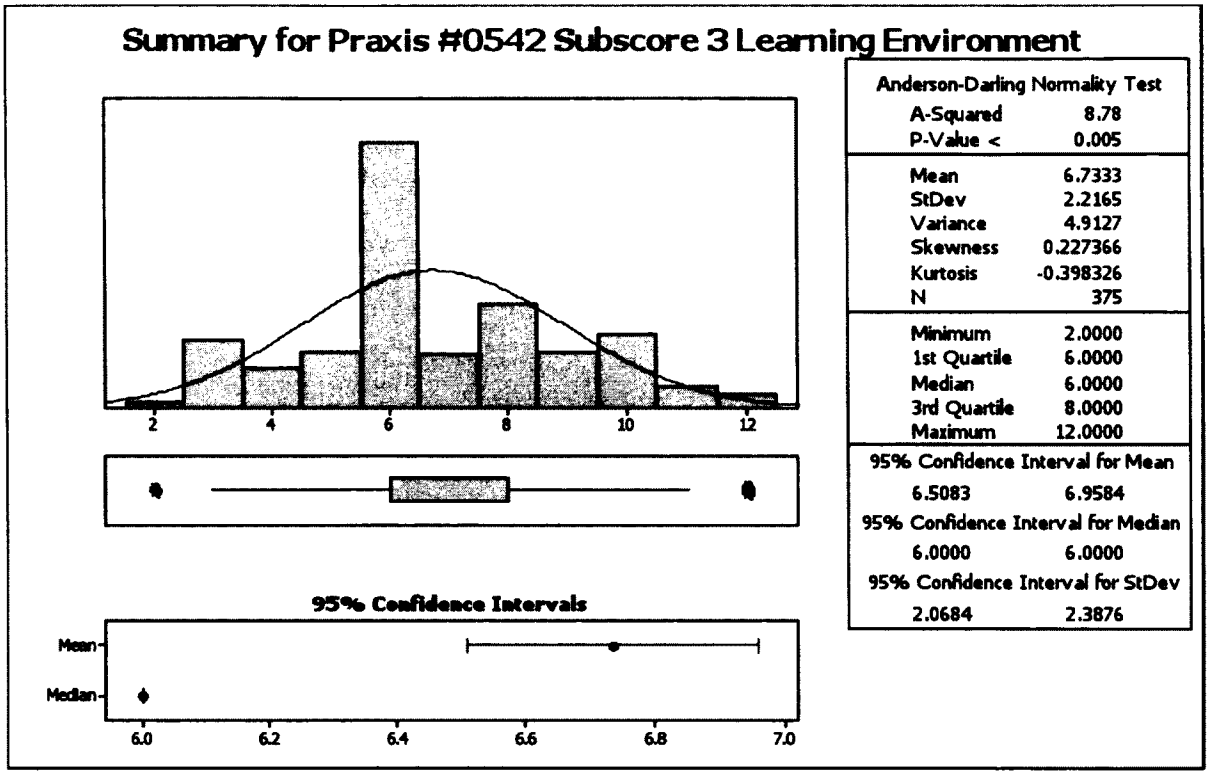


Anderson-Darling Normality Test	
A-Squared	8.50
P-Value <	0.005
Mean	6.7813
StDev	2.3515
Variance	5.5296
Skewness	0.017484
Kurtosis	-0.437859
N	375
Minimum	0.0000
1st Quartile	6.0000
Median	6.0000
3rd Quartile	8.0000
Maximum	12.0000
95% Confidence Interval for Mean	
6.5426	7.0201
95% Confidence Interval for Median	
6.0000	6.9750
95% Confidence Interval for StDev	
2.1944	2.5330

Summary for Praxis #0542 Curriculum and Instruction



Anderson-Darling Normality Test	
A-Squared	3.96
P-Value <	0.005
Mean	9.3707
StDev	2.3557
Variance	5.5494
Skewness	0.100340
Kurtosis	-0.381854
N	375
Minimum	5.0000
1st Quartile	8.0000
Median	10.0000
3rd Quartile	11.0000
Maximum	15.0000
95% Confidence Interval for Mean	
9.1315	9.6099
95% Confidence Interval for Median	
9.0000	10.0000
95% Confidence Interval for StDev	
2.1983	2.5376


Summary for Praxis #0542 Subscore 3 Learning Environment
Anderson-Darling Normality Test
A-Squared 8.78
P-Value < 0.005
Mean 6.7333
StDev 2.2165
Variance 4.9127
Skewness 0.227366
Kurtosis -0.398326
N 375
Minimum 2.0000
1st Quartile 6.0000
Median 6.0000
3rd Quartile 8.0000
Maximum 12.0000
95% Confidence Interval for Mean
6.5083 6.9584
95% Confidence Interval for Median
6.0000 6.0000
95% Confidence Interval for StDev
2.0684 2.3876
2 4 6 8 10 12
95% Confidence Intervals
Mean
Median
6.0 6.2 6.4 6.6 6.8 7.0

Appendix J

Participant Undergraduate Grade Point Average Data

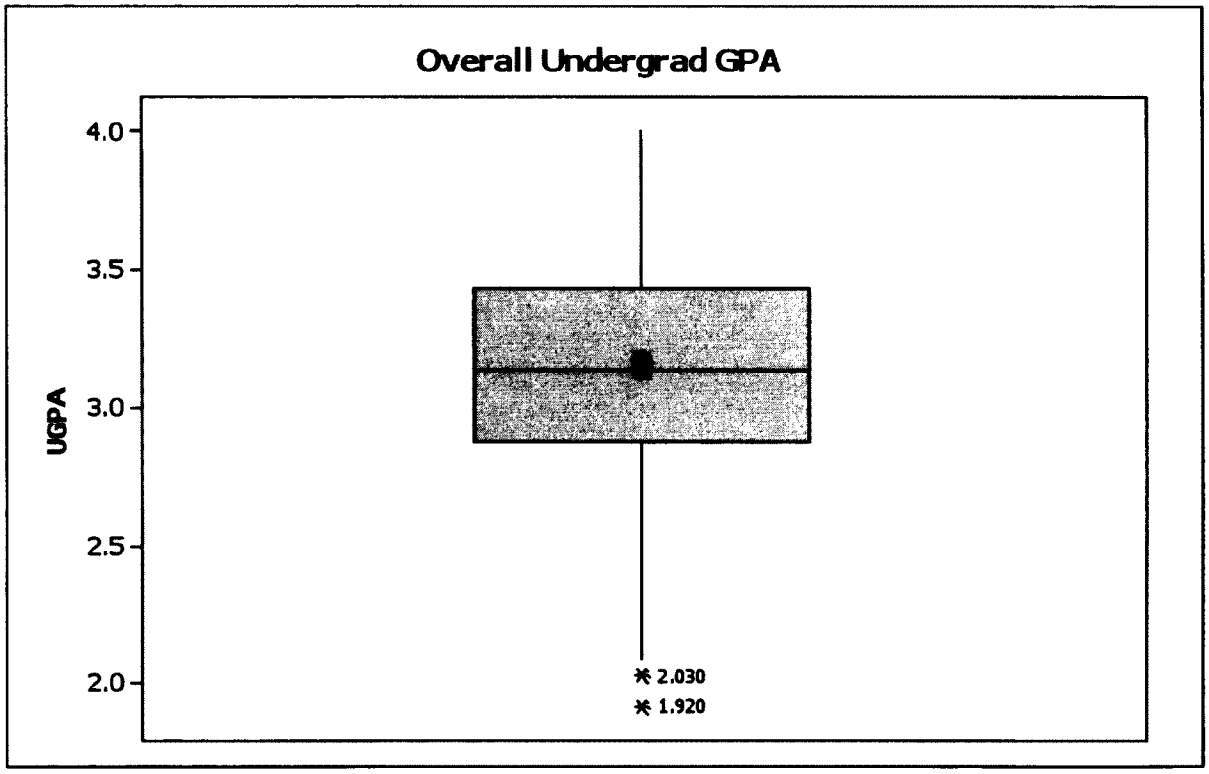
Descriptive Statistics:

Undergraduate GPA for Participants

Variable	N	N*	Mean	SE Mean	StDev	Variance	Minimum	Q1	Q3
UGPA	490	16	3.1731	0.0177	0.3921	0.1537	1.9200	2.8800	3.4315

Variable	Maximum	Range	IQR**
UGPA	4.0000	2.0800	0.5515

* Data not available for 16 participants of the 506 total study participants
**Interquartile Range (Quartile 3 - Quartile 1)



Descriptive Statistics: Undergraduate GPA by Ethnicity

Variable	Ethnicity	N	N*	Mean	SE Mean	StDev	Variance	Minimum
UGPA	Other	54	2	2.9909	0.0530	0.3892	0.1515	2.0300
	White	436	14	3.1956	0.0185	0.3870	0.1497	1.9200

Variable	Ethnicity	Q1	Q3	Maximum	Range	IQR
UGPA	Other	2.8185	3.1425	4.0000	1.9700	0.3240
	White	2.9000	3.4648	4.0000	2.0800	0.5648

Descriptive Statistics: Undergraduate GPA by Gender

Variable	Gender	N	N*	Mean	SE Mean	StDev	Variance	Minimum	Q1
UGPA	F	352	11	3.2280	0.0202	0.3789	0.1436	2.0300	2.9500
	M	138	5	3.0330	0.0333	0.3917	0.1534	1.9200	2.7600

Variable	Gender	Q3	Maximum	Range	IQR
UGPA	F	3.4983	4.0000	1.9700	0.5482
	M	3.2600	4.0000	2.0800	0.5000

One-Way Analysis of Variance (ANOVA): Undergraduate GPA versus Graduation Status

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
Active	231	3.1449	0.3913	(------*-------)
2008 Grad	87	3.1995	0.4253	(-----------*-----------)
2009 Grad	77	3.1509	0.4019	(-----------*-----------)
2010 Grad	95	3.2352	0.3494	(----------*----------)
				3.080 3.150 3.220 3.290

Pooled Standard Deviation = 0.3916

Source	DF	SS	MS	F	P
GradStatus	3	0.648	0.216	1.41	0.240
Error	486	74.535	0.153		
Total	489	75.183			

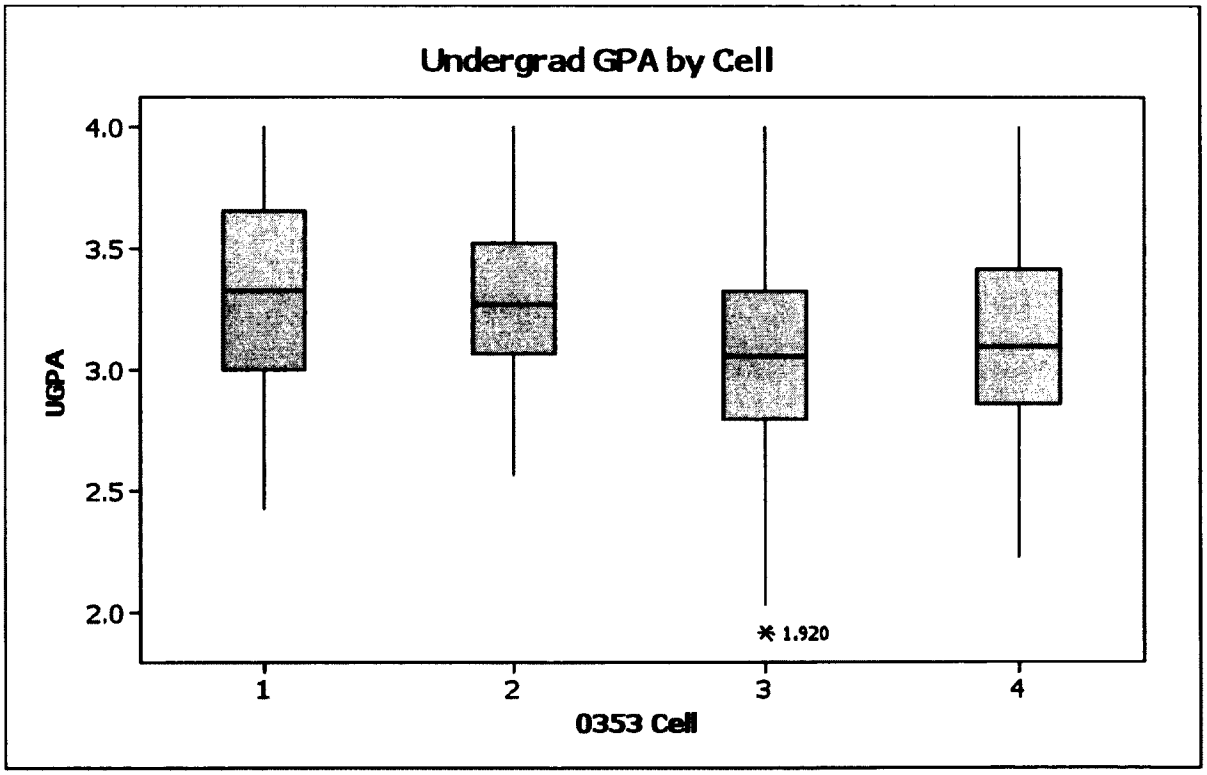
S = 0.3916 R-Sq = 0.86% R-Sq(adj) = 0.25%

Descriptive Statistics for Undergraduate GPA by Praxis Test #0353 Background/Field Cell

Variable	0353 Cell***	N	N*	Mean	SE Mean	StDev	Variance	Minimum	Q1
UGPA	1	47	0	3.3379	0.0541	0.3708	0.1375	2.4300	3.0000
	2	97	2	3.2960	0.0334	0.3293	0.1085	2.5700	3.0640
	3	156	6	3.0729	0.0323	0.4031	0.1625	1.9200	2.7935
	4	190	8	3.1517	0.0284	0.3908	0.1528	2.2300	2.8600

Variable	0353 Cell***	Q3	Maximum	Range	IQR**
UGPA	1	3.6600	4.0000	1.5700	0.6600
	2	3.5250	4.0000	1.4300	0.4610
	3	3.3300	4.0000	2.0800	0.5365
	4	3.4200	4.0000	1.7700	0.5600

* Data not available for 16 participants of the 506 total study participants
** Interquartile Range (Quartile 3 - Quartile 1)
***0353Cell is the cell that describes the participant's status as of Praxis #0353
testing
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences



Descriptive Statistics for Undergraduate GPA by Praxis Test #0542 Background/Field Cell

Variable	542Cell***	N	N*	Mean	SE Mean	StDev	Variance	Minimum	Q1
UGPA	1	43	0	3.3307	0.0553	0.3625	0.1314	2.4300	3.0000
	2	66	1	3.2860	0.0380	0.3086	0.0952	2.5700	3.1100
	3	144	4	3.0875	0.0345	0.4136	0.1710	1.9200	2.8125
	4	116	8	3.1645	0.0351	0.3779	0.1428	2.2650	2.8700
	Total	369	13						

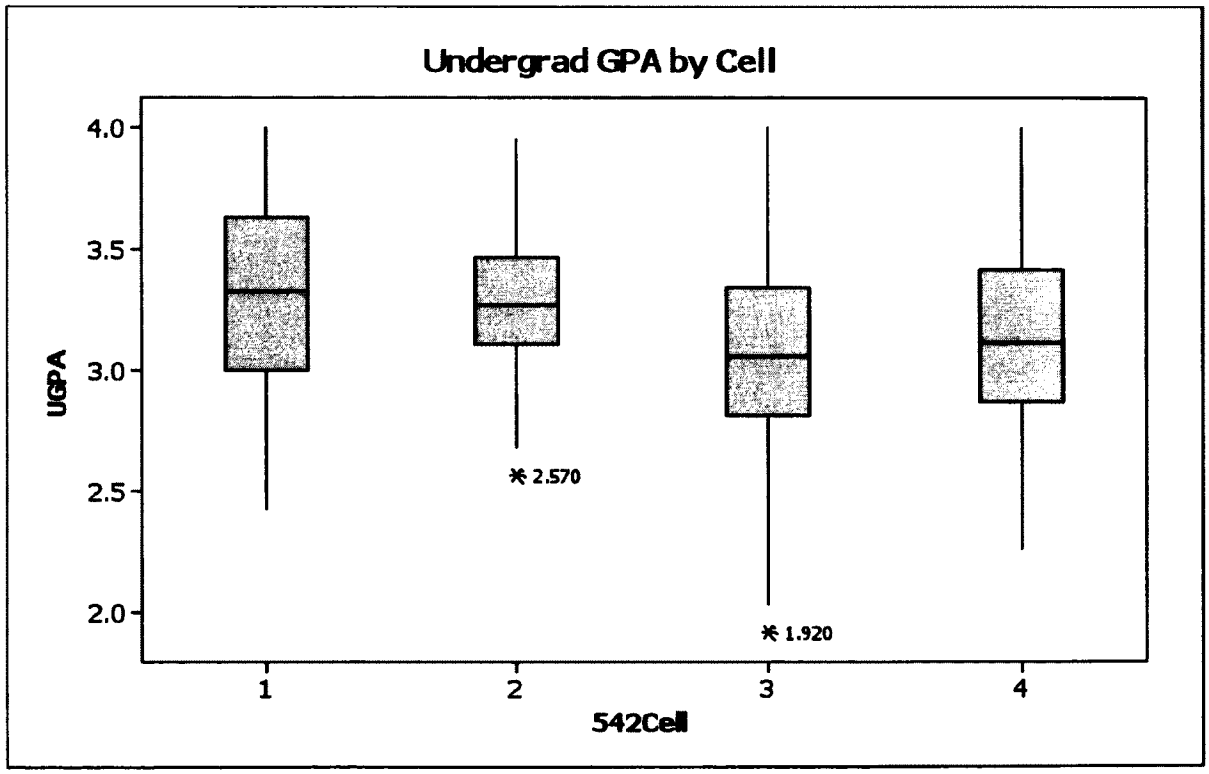
Variable	542Cell***	Q3	Maximum	Range	IQR**
UGPA	1	3.6300	4.0000	1.5700	0.6300
	2	3.4678	3.9520	1.3820	0.3578
	3	3.3475	4.0000	2.0800	0.5350
	4	3.4175	4.0000	1.7350	0.5475

* Data not available (13 missing undergraduate GPA's from the 382 participants who took the Praxis #0542 test

** Interquartile Range (Quartile 3 - Quartile 1)

***0542Cell is the cell that describes the participant's status as of Praxis #0542 testing

Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences



Appendix K

Participant Data on Program Hours and Patterns

Descriptive Statistics for Cumulative Program Hours Prior to Initial Praxis #0353 Testing

Variable	0353 Cell***	N	N*	Mean	SE Mean	StDev	Variance	Minimum	Q1
Cum353	1	47	0	21.170	0.862	5.906	34.883	11.000	17.000
	2	99	0	23.263	0.540	5.373	28.869	6.000	20.000
	3	162	0	19.488	0.428	5.447	29.668	6.000	16.000
	4	198	0	17.965	0.391	5.497	30.217	3.000	14.000

Variable	0353 Cell***	Q3	Maximum	Range	IQR**
Cum353	1	26.000	33.000	22.000	9.000
	2	27.000	36.000	30.000	7.000
	3	23.000	34.000	28.000	7.000
	4	20.000	39.000	36.000	6.000

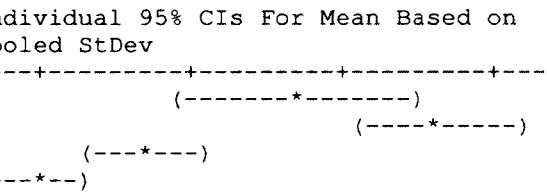
* Data not available
** Interquartile Range (Quartile 3 - Quartile 1)
***0353Cell is the cell that describes the participant's status as of Praxis #0353
testing
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

One-Way Analysis of Variance (ANOVA): Cumulative Program Hours by Praxis #-0353 Cell

Source	DF	SS	MS	F	P
0353 Cell	3	2066.4	688.8	22.97	0.000
Error	502	15054.6	30.0		
Total	505	17120.9			

S = 5.476 R-Sq = 12.07% R-Sq(adj) = 11.54%

Level	N	Mean	StDev
1	48	21.417	6.087
2	101	23.267	5.323
3	161	19.404	5.358
4	196	17.908	5.494



Pooled StDev = 5.476

* Level = Cell
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)

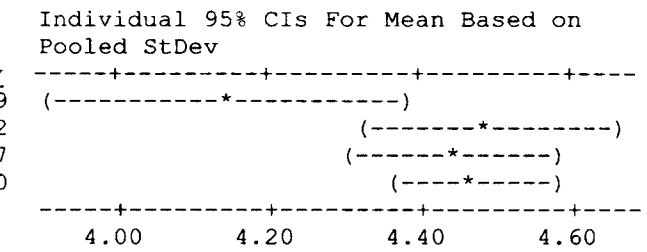
Cell 4 = New to education, Traditional practicum field experiences

One-Way Analysis of Variance (ANOVA): ECE Methods Cluster Courses by Praxis #-0353 Cell

Source	DF	SS	MS	F	P
0353 Cell	3	4.503	1.501	2.09	0.100
Error	502	359.713	0.717		
Total	505	364.215			

S = 0.8465 R-Sq = 1.24% R-Sq(adj) = 0.65%

Level*	N	Mean	StDev
1	48	4.1458	0.8749
2	101	4.4851	0.7952
3	161	4.4410	0.8127
4	196	4.4694	0.8910



Pooled StDev = 0.8465

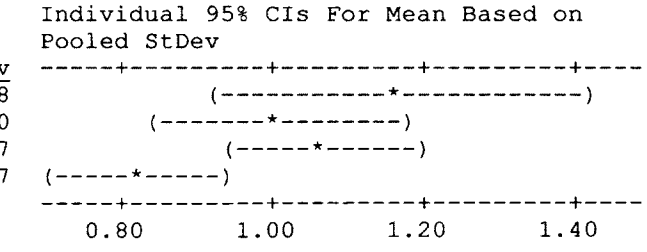
* Level = Cell
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

One-Way Analysis of Variance (ANOVA): LBD Field Cluster Courses by Praxis #-0353 Cell

Source	DF	SS	MS	F	P
0353 Cell	3	7.605	2.535	3.40	0.018
Error	502	374.007	0.745		
Total	505	381.613			

S = 0.8632 R-Sq = 1.99% R-Sq(adj) = 1.41%

Level*	N	Mean	StDev
1	48	1.1667	0.8078
2	101	1.0099	0.9110
3	161	1.0683	0.8597
4	196	0.8265	0.8537



Pooled StDev = 0.8632

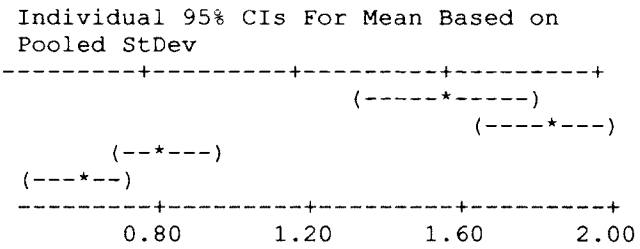
* Level = Cell
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

One-Way Analysis of Variance (ANOVA): EDU Methods Cluster Courses by Praxis #-0353 Cell

Source	DF	SS	MS	F	P
0353 Cell	3	124.490	41.497	50.50	0.000
Error	502	412.508	0.822		
Total	505	536.998			

S = 0.9065 R-Sq = 23.18% R-Sq(adj) = 22.72%

Level*	N	Mean	StDev
1	48	1.5625	1.1281
2	101	1.8317	1.0106
3	161	0.8075	0.9187
4	196	0.5867	0.7697



Pooled StDev = 0.9065

* Level = Cell
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

Descriptive Statistics for Cumulative Program Hours Prior to Initial Praxis #0542 Testing

Variable	542Cell	N	N*	Mean	SE Mean	StDev	Variance	Minimum	Q1
Cum542	1	43	0	23.91	1.03	6.75	45.51	11.00	19.00
	2	67	0	25.403	0.653	5.349	28.608	13.000	22.000
	3	148	0	22.385	0.582	7.078	50.102	8.000	17.000
	4	124	0	21.040	0.609	6.777	45.925	5.000	16.000
	Total	382							

Variable	542Cell	Q3	Maximum	Range	IQR
Cum542	1	27.00	39.00	28.00	8.00
	2	28.000	39.000	26.000	6.000
	3	28.000	39.000	31.000	11.000
	4	26.000	37.000	32.000	10.000

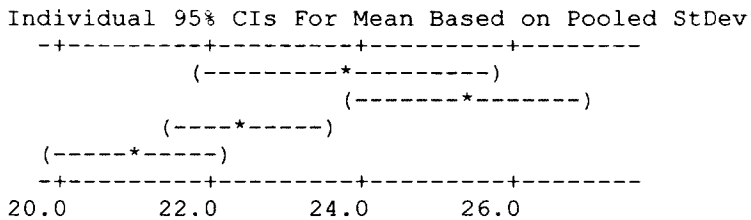
* Data not available
** Interquartile Range (Quartile 3 - Quartile 1)
***0542Cell is the cell that describes the participant's status as of Praxis #0353
testing
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

One-Way Analysis of Variance (ANOVA): Cumulative Program Hours by Praxis #-0542 Cell

Source	DF	SS	MS	F	P
542Cell	3	895.2	298.4	6.70	0.000
Error	378	16825.8	44.5		
Total	381	17721.0			

S = 6.672 R-Sq = 5.05% R-Sq(adj) = 4.30%

Level*	N	Mean	StDev
1	44	23.750	6.748
2	69	25.348	5.285
3	147	22.422	7.088
4	122	21.000	6.822



Pooled StDev = 6.672

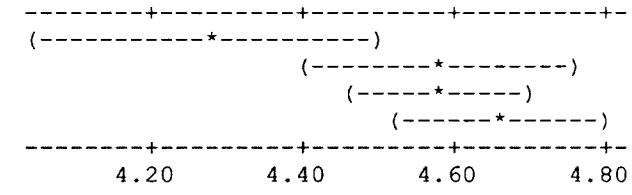
* Level = Cell
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

One-Way Analysis of Variance (ANOVA): ECE Methods Cluster Courses by Praxis #0542 Cell

Source	DF	SS	MS	F	P
542Cell	3	4.825	1.608	2.75	0.042
Error	378	220.767	0.584		
Total	381	225.592			

S = 0.7642 R-Sq = 2.14% R-Sq(adj) = 1.36%

Level	N	Mean	StDev
1	44	4.2727	0.8987
2	69	4.5797	0.7747
3	147	4.5850	0.7388
4	122	4.6557	0.7360



Pooled StDev = 0.7642

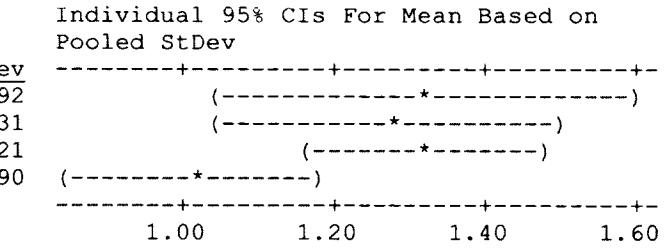
* Level = Cell
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

One-Way Analysis of Variance (ANOVA): LBD Field Cluster Courses by Praxis #0542 Cell

Source	DF	SS	MS	F	P
542Cell	3	7.144	2.381	2.56	0.055
Error	378	351.254	0.929		
Total	381	358.398			

S = 0.9640 R-Sq = 1.99% R-Sq(adj) = 1.22%

Level	N	Mean	StDev
1	44	1.3182	0.9092
2	69	1.2754	0.9531
3	147	1.3197	0.9721
4	122	1.0164	0.9790



Pooled StDev = 0.9640

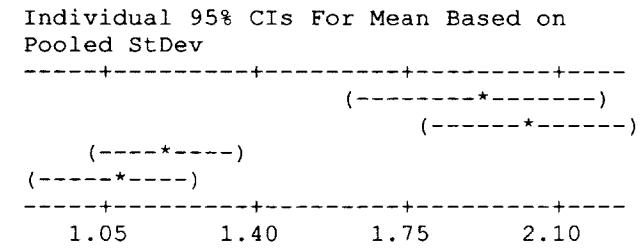
* Level = Cell
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

One-Way Analysis of Variance (ANOVA): EDU Methods Cluster Courses by Praxis #0542 Cell

Source	DF	SS	MS	F	P
542Cell	3	56.81	18.94	17.65	0.000
Error	378	405.62	1.07		
Total	381	462.43			

S = 1.036 R-Sq = 12.28% R-Sq(adj) = 11.59%

Level*	N	Mean	StDev
1	44	1.909	0.984
2	69	2.014	1.007
3	147	1.190	1.094
4	122	1.074	0.997



Pooled StDev = 1.036

* Level = Cell
Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

Appendix L

Supplemental Data for Research Question 1 Model

General Linear Model ANOVA for Predicting Praxis #0353 Score

$$Y_1 = \text{Constant} + b_0\text{Background} + b_1\text{0353Field} + b_2\text{Background*0353Field}$$

Factor	Type	Levels	Values
353Bckgr	fixed	2	0= New to education; 1 = Already certified
353Field	fixed	2	0= Traditional practicum; 1 = LBD teacher (alternate route)

Analysis of Variance for 353score, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
353Bckgr	1	957.1	985.9	985.9	5.74	0.017
353Field	1	118.4	117.2	117.2	0.68	0.409
353Bckgr*353Field	1	6.9	6.9	6.9	0.04	0.842
Error	502	86297.5	86297.5	171.9		
Total	505	87379.9				

S = 13.1113 R-Sq = 1.24% R-Sq(adj) = 0.65%

Term	Coef	SE Coef	T	P
Constant	172.771	0.677	255.37	0.000
353Bckgr				
New to education	-1.6202	0.6765	-2.39	0.017
353Field				
Traditional pract	-0.5587	0.6765	-0.83	0.409
353Bckgr*353Field				
New*Traditional	0.1353	0.6765	0.20	0.842

Unusual Observations for 353score

Obs	353score	Fit	SE Fit	Residual	St Resid
12	143.000	170.727	0.932	-27.727	-2.12 R
14	148.000	175.085	1.912	-27.085	-2.09 R
16	143.000	170.727	0.932	-27.727	-2.12 R
22	128.000	170.727	0.932	-42.727	-3.27 R
31	139.000	171.574	1.030	-32.574	-2.49 R
55	200.000	171.574	1.030	28.426	2.17 R
110	200.000	170.727	0.932	29.273	2.24 R
120	197.000	170.727	0.932	26.273	2.01 R
129	121.000	170.727	0.932	-49.727	-3.80 R
157	143.000	170.727	0.932	-27.727	-2.12 R
176	200.000	170.727	0.932	29.273	2.24 R
192	145.000	171.574	1.030	-26.574	-2.03 R
228	140.000	170.727	0.932	-30.727	-2.35 R
230	200.000	170.727	0.932	29.273	2.24 R
266	126.000	171.574	1.030	-45.574	-3.49 R
293	200.000	170.727	0.932	29.273	2.24 R
332	140.000	170.727	0.932	-30.727	-2.35 R
334	138.000	170.727	0.932	-32.727	-2.50 R
342	139.000	170.727	0.932	-31.727	-2.43 R
364	134.000	170.727	0.932	-36.727	-2.81 R

370	143.000	170.727	0.932	-27.727	-2.12	R
372	136.000	171.574	1.030	-35.574	-2.72	R
390	200.000	170.727	0.932	29.273	2.24	R
391	142.000	170.727	0.932	-28.727	-2.20	R
400	197.000	170.727	0.932	26.273	2.01	R
415	131.000	170.727	0.932	-39.727	-3.04	R
423	138.000	170.727	0.932	-32.727	-2.50	R
496	121.000	171.574	1.030	-50.574	-3.87	R

R denotes an observation with a large standardized residual.

General Linear Model ANOVA for Predicting Praxis #0542 Score

$$Y_2 = \text{Constant} + b_0\text{Background} + b_1\text{0542Field} + b_2\text{Background*0542Field}$$

Factor	Type	Levels	Values
0542Bckgr	fixed	2	0= New to education; 1 = Already certified
0542Field	fixed	2	0= Traditional practicum; 1 = LBD teacher (alternate route)

Analysis of Variance for 542score, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
0542Bckgr	1	1453.2	1435.4	1435.4	12.64	0.000
0542Field	1	329.6	91.1	91.1	0.80	0.371
0542Bckgr*0542Field	1	234.6	234.6	234.6	2.07	0.151
Error	378	42925.4	42925.4	113.6		
Total	381	44942.8				

S = 10.6564 R-Sq = 4.49% R-Sq(adj) = 3.73%

Term	Coef	SE Coef	T	P
Constant	181.547	0.613	296.00	0.000
0542Bckgr				
New to education	-2.1806	0.6133	-3.56	0.000
0542Field				
Traditional	-0.5494	0.6133	-0.90	0.371
0542Bckgr*0542Field				
	-0.8815	0.6133	-1.44	0.151

Unusual Observations for 542score

Obs	542score	Fit	SE Fit	Residual	St Resid	
31	136.000	180.797	0.876	-44.797	-4.22	R
44	156.000	180.797	0.876	-24.797	-2.33	R
58	157.000	184.060	1.302	-27.060	-2.56	R
111	145.000	177.935	0.957	-32.935	-3.10	R
201	156.000	177.935	0.957	-21.935	-2.07	R
261	151.000	177.935	0.957	-26.935	-2.54	R
269	160.000	183.395	1.625	-23.395	-2.22	R
280	147.000	180.797	0.876	-33.797	-3.18	R
308	143.000	177.935	0.957	-34.935	-3.29	R
363	156.000	177.935	0.957	-21.935	-2.07	R
370	156.000	177.935	0.957	-21.935	-2.07	R
382	158.000	180.797	0.876	-22.797	-2.15	R
396	156.000	177.935	0.957	-21.935	-2.07	R

R denotes an observation with a large standardized residual.

Appendix M

Supplemental Data for Research Question 2 Model

General Linear Model ANOVA for Predicting Praxis #0353 Score

$$Y_1 = \text{Constant} + b_0\text{GPA} + b_1\text{CumHrs} + b_2\text{Background} + b_j\text{Cell} + b_4\text{Gender} + b_5\text{Ethnicity}$$

Factor	Type	Levels	Values
Gender	fixed	2	F = female, M = male
Ethnicity	fixed	2	O = other, W = white
353Bckgr	fixed	2	0 = new to education, 1 = already-certified
0353 Cell	fixed	4	1, 2, 3, 4

Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

Analysis of Variance for 353score, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
UGPA	1	3375.4	1033.5	1033.5	6.99	0.008
Cum353	1	614.0	788.9	788.9	5.34	0.021
0353 Cell	3	986.3	765.3	255.1	1.73	0.161
Gender	1	3644.1	3564.4	3564.4	24.11	0.000
Ethnicity	1	3155.9	3068.7	3068.7	20.76	0.000
353Bckgr	1	0.0	0.0	0.0	0.00	0.998
Error	481	71110.2	71110.2	147.8		
Total	489	82885.9				

S = 12.1589 R-Sq = 14.21% R-Sq(adj) = 12.78%

Term	Coef	SE Coef	T	P
Constant	160.130	5.224	30.65	0.000
UGPA	3.946	1.493	2.64	0.008
Cum353	-0.2344	0.1015	-2.31	0.021
0353 Cell				
1	1.715	4.547	0.38	0.706
2	0.203	4.563	0.04	0.965
3	0.498	4.462	0.11	0.911
Gender				
F	3.1455	0.6406	4.91	0.000
Ethnicity				
O	-4.1708	0.9154	-4.56	0.000
353Bckgr				
0	-0.012	4.461	-0.00	0.998

Unusual Observations for 353score

Obs	353score	Fit	SE Fit	Residual	St Resid	
12	143.000	172.206	1.037	-29.206	-2.41	R
14	148.000	172.229	2.094	-24.229	-2.02	R
16	143.000	169.699	1.480	-26.699	-2.21	R
22	128.000	172.015	1.065	-44.015	-3.63	R
110	200.000	175.386	1.134	24.614	2.03	R
133	156.000	161.083	8.734	-5.083	-0.60	X
176	200.000	175.452	1.352	24.548	2.03	R

192	145.000	176.055	1.325	-31.055	-2.57	R
228	140.000	168.877	1.725	-28.877	-2.40	R
266	126.000	164.162	2.115	-38.162	-3.19	R
282	197.000	168.854	1.499	28.146	2.33	R
293	200.000	173.429	0.965	26.571	2.19	R
321	148.000	177.586	1.609	-29.586	-2.45	R
334	138.000	166.117	1.388	-28.117	-2.33	R
342	139.000	168.301	1.444	-29.301	-2.43	R
364	134.000	160.910	2.611	-26.910	-2.27	R
372	136.000	169.014	1.410	-33.014	-2.73	R
415	131.000	162.995	1.884	-31.995	-2.66	R
423	138.000	173.342	0.965	-35.342	-2.92	R
458	163.000	157.917	8.734	5.083	0.60	X
460	148.000	173.123	1.138	-25.123	-2.08	R
480	151.000	175.342	1.157	-24.342	-2.01	R
496	121.000	160.640	1.978	-39.640	-3.30	R
498	148.000	173.306	0.967	-25.306	-2.09	R

R denotes an observation with a large standardized residual.
X denotes an observation whose X value gives it large leverage.

General Linear Model ANOVA for Predicting Praxis #0542 Score

$$Y_1 = \text{Constant} + b_0\text{GPA} + b_1\text{CumHrs} + b_2\text{Background} + b_j\text{Cell} + b_4\text{Gender} + b_5\text{Ethnicity}$$

Factor	Type	Levels	Values
Gender	fixed	2	F = female, M = male
Ethnicity	fixed	2	O = other, W = white
0542Bckgr	fixed	2	0 = new to education, 1 = already-certified
542Cell	fixed	4	1, 2, 3, 4

Cell 1 = Already-certified, Teaching LBD (alternate route)
Cell 2 = Already-certified, Traditional practicum field experience
Cell 3 = New to education, Teaching LBD (alternate route)
Cell 4 = New to education, Traditional practicum field experiences

Analysis of Variance for 542score, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
UGPA	1	2533.2	1191.4	1191.4	11.30	0.001
Cum542	1	15.5	161.9	161.9	1.54	0.216
542Cell	3	1817.9	1306.4	435.5	4.13	0.007
Gender	1	1607.0	1592.0	1592.0	15.10	0.000
Ethnicity	1	438.0	364.6	364.6	3.46	0.064
0542Bckgr	1	59.2	59.2	59.2	0.56	0.454
Error	360	37967.9	37967.9	105.5		
Total	368	44438.7				

S = 10.2697 R-Sq = 14.56% R-Sq(adj) = 12.66%

Term	Coef	SE Coef	T	P
Constant	165.543	4.954	33.42	0.000
UGPA	4.917	1.463	3.36	0.001
Cum542	-0.10215	0.08243	-1.24	0.216
542Cell				
1	-1.313	3.875	-0.34	0.735
2	-1.098	3.873	-0.28	0.777
3	3.489	3.774	0.92	0.356

```
Gender
F            2.4584    0.6328    3.89  0.000
Ethnicity
O           -1.5502    0.8337   -1.86  0.064
0542Bckgr
0            -2.844     3.796   -0.75  0.454


Unusual Observations for 542score

Obs  542score      Fit  SE Fit  Residual  St Resid
 31    136.000  174.701   1.883   -38.701     -3.83 R
 45    162.000  183.050   1.530   -21.050     -2.07 R
 58    157.000  181.976   2.058   -24.976     -2.48 R
111    145.000  170.508   1.659   -25.508     -2.52 R
133    172.000  170.539   7.400     1.461      0.21 X
201    156.000  177.956   1.175   -21.956     -2.15 R
261    151.000  178.534   1.046   -27.534     -2.70 R
269    160.000  181.676   1.943   -21.676     -2.15 R
280    147.000  182.704   1.652   -35.704     -3.52 R
308    143.000  177.525   1.359   -34.525     -3.39 R
353    199.000  177.944   1.101    21.056      2.06 R
396    156.000  179.906   1.494   -23.906     -2.35 R
409    200.000  176.346   1.587    23.654      2.33 R
458    167.000  168.461   7.400    -1.461     -0.21 X
460    158.000  179.892   1.100   -21.892     -2.14 R

R denotes an observation with a large standardized residual.
X denotes an observation whose X value gives it large leverage.
```

Appendix N

Focus Group Summaries

Focus Group 1 Summary: Already-Certified, Teaching LBD at Time of First Testing

$n = 2$

INTRODUCTORY/WARM-UP QUESTION

9 WHAT LED YOU TO PURSUE BEING AN LBD TEACHER?

- Interest from undergraduate (elementary education), but several job interviews led me to the field
- I needed to expand my teaching options in different areas, more training other than physical education (PE); people not hiring women coaches

MAIN QUESTIONS

- WHAT DO YOU BELIEVE YOU NEED TO KNOW TO BEGIN AS AN LBD TEACHER?

- Paperwork – knowing how to do it, all the forms
- Progress monitoring
- Strategies to use with different disabilities
- A complete reference guide to the core content curriculum (PE is not core content)
- Differentiation strategies

FOLLOW-UP #1: ARE ANY OF (THESE) MOST IMPORTANT AS YOU STARTED IN LBD?

- Paperwork!
- Knowing the rules and regulations on confidentiality
- Core content curriculum
- Knowing the different disabilities and ways to teach them

FOLLOW-UP #2: HOW WELL-PREPARED DO YOU FEEL FOR BEING AN LBD TEACHER?

- Unprepared at the beginning but learned on the job and now feel very prepared after a year
- Unprepared at first; had a teaching degree (PE) but no experience

FOLLOW-UP #3: WHAT DID YOU NEED TO KNOW THAT WAS DIFFERENT OR IN ADDITION TO YOUR ORIGINAL TRAINING?

- Progress monitoring and co-teaching strategies
- Needed to broaden my experiences

- Knowing the different disabilities and how to teach them in a better atmosphere – caring for them

10. How did you gain your knowledge about special education and LBD teaching practices?

- From experience
- Mentor really helped, also the college observer
- Feedback and help from professors
- Life experiences, not the program itself

Follow-up: Were any of these sources most important to you?

- The practicum observations and feedback
- Hands-on experiences
- Reflections through the journal

11. How did your knowledge about these areas change during the program?

- Unprepared at the beginning and didn't know the expectations, but learned on the job and now feel very knowledgeable
- Learned how to develop and teach a plan [for students with diabilities] and change up if it was not working for individual students

Follow-up: How confident do you feel in applying this knowledge in the classroom?

- Confident because of the experiences and the teachers I work with
- Very confident and have applied it in the classroom, e.g., use of math manipulatives so students could understand

12. How well did the LBD Praxis testing capture and reflect your knowledge about special education and LBD?

- Common sense but the scenarios did not apply to the kids or age group I work with
- More of a general test to make sure everyone understands basic concepts, but didn't hone in on what I learned

13. Are there any suggestions that you have for the LBD program to help you learn or acquire this knowledge better?

- More experience is needed on the paperwork, not just the IEP
- Need experience in annual evaluations, re-evaluations, conference summaries, etc.
- Social networking with others who are out in a school, not just meeting on campus once a semester

Focus Group 2 Summary

Already-Certified, Traditional Practicum Experiences at Time of First Test

$n = 3$

INTRODUCTORY/WARM-UP QUESTION

1. WHAT LED YOU TO PURSUE BEING AN LBD TEACHER?

    - I was a general ed 2nd grade techer, had a knack with the special education students and thought this would help me to serve them; now I am moved to special education
    - I was a Spanish teacher and understood how they learn differently, you cannot do the same thing in regular education for all kids; now I am in special education

MAIN QUESTIONS

2. WHAT DO YOU BELIEVE YOU NEED TO KNOW TO BEGIN AS AN LBD TEACHER?

    - Paperwork was the most overwhelming, what to put where on forms
    - Procedures and protocols
    - Progress monitoring
    - More about individualized instruction
    - Different types of disabilities
    - Due process and legal procedures. If I were to switch to LBD right now, I would feel uncomfortable in this area.

FOLLOW-UP #1: ARE ANY OF (THESE) MOST IMPORTANT AS YOU STARTED IN LBD?

- Paperwork
- The due process piece, though I have not taught in LBD
- Different types of disabilities and how to accommodate your teaching for them

FOLLOW-UP #2: HOW WELL-PREPARED DO YOU FEEL FOR BEING AN LBD TEACHER?

- At first felt somewhat prepared, but never really expected what special educators did; Once I got my caseload I was overwhelmed
- Well-prepared. I was teaching Spanish before special education, and took behavior management and volunteered to co-teach with an LBD teacher
- Very prepared; if I were not rehired in social studies, I would feel confident taking an LBD position

FOLLOW-UP #3: WHAT DID YOU NEED TO KNOW THAT WAS DIFFERENT OR IN ADDITION TO YOUR ORIGINAL TRAINING?

- Co-teaching strategies, teaching general educators to do it – not always open
- The paperwork – the different types of forms needed and how to complete these; the school expected me to know that when I because a special education teacher
- I was certified in high school, so I needed to learn LBD but also how to teach elementary level. I got to work with elementary students and now I feel confident with them

3. HOW DID YOU GAIN YOUR KNOWLEDGE ABOUT SPECIAL EDUCATION AND LBD TEACHING PRACTICES?

- Practicum – it gave me hands-on experience with the practicum, not just reading the books
- Practicum and observations, particularly the college observer answered questions and helped out, especially in behavior issues
- The coursework and the LBD field work. I dreaded the field work and thought it would be a pain, but I learned from it and the teachers I worked with.
- The field work surprised me on how well it prepared me
- Course work [general]

FOLLOW-UP: WERE ANY OF THESE SOURCES MOST IMPORTANT TO YOU?

- Observations – wanted more behavior training
- Teacher experiences – faculty at my school shared their experiences
- Physically teaching, practicum gave me the hands-on experiences I needed
- The collaboration – you work with the regular ed teacher who gives the assignment and you modify it and have to work in a team environment with lots of collaboration. I was used to working independently

4. HOW DID YOUR KNOWLEDGE ABOUT THESE AREAS CHANGE DURING THE PROGRAM?

- I gained more knowledge – it changed my perspective on special educaiton
- It actually helped me become a better teacher – a lot of insights into my teaching and my career
- I learned to work with a team of teachers and how important that is
- Working on behalf of the students when a reugular educator wants to push them off on the special educator was good for me.
- I sought extra materials if needed
- Cannot speak highly enough of certain professors that were helpful and answered questions

FOLLOW-UP: HOW CONFIDENT DO YOU FEEL IN APPLYING THIS KNOWLEDGE IN THE CLASSROOM?

- Very, due to working with wonderful people at school – can go to them and they will help out
- Very, because of the experiences at ABC
- Very, now I understand what and why to accommodate and modify for students, not to make it easier but how to make the student successful in learning the content

5. HOW WELL DID THE LBD PRAXIS TESTING CAPTURE AND REFLECT YOUR KNOWLEDGE ABOUT SPECIAL EDUCATION AND LBD?

   - Don't recall what was on the Praxis that was beneficial to what I do
   - Very well, particularly the laws, though I had difficulty with that
   - The ABC Praxis seminar and school helps you with what to study
   - It was surprising, a pretty good test. Usually tests don't measure what you know but it actually wasn't hard for me and went along with what we had learned at ABC

6. ARE THERE ANY SUGGESTIONS THAT YOU HAVE FOR THE LBD PROGRAM TO HELP YOU LEARN OR ACQUIRE THIS KNOWLEDGE BETTER?

   - More on collaboration and co-teaching
   - Paperwork needs more in-depth focus; don't learn much except the IEP
   - A class on the forms and how to write an IEP – what state forms are required
   - Infinite Campus [statewide student data system] training would be helpful
   - Nothing I can suggest, but I recommend the program to others – it is great

Focus Group 3 Summary: New to Education, Teaching LBD at Time of First Testing

$n = 3$

INTRODUCTORY/WARM-UP QUESTION

1. WHAT LED YOU TO PURSUE BEING AN LBD TEACHER?

    - I had a bachelor degree in individual and family development and wanted to get into education, but the program at my institution was too competitive to get in.
    - I had a heart for students with and without disabilities

MAIN QUESTIONS

2. WHAT DO YOU BELIEVE YOU NEED TO KNOW TO BEGIN AS AN LBD TEACHER?

    - Characteristics of the different disabilties, what to look for and how to help make modifications and design instruction
    - Autism
    - How to write an IEP
    - Different types of disabilities and eligibility criteria
    - Legal aspects of special education
    - Assessment to design and modify instruction
    - Not coming from education, the need to learn a new culture especially with special education more specialized than general education

FOLLOW-UP #1: ARE ANY OF (THESE) MOST IMPORTANT AS YOU STARTED IN LBD?

    - Knowing the disabilities and how to write an IEP
    - Inclusion – how I could be effective in delivering instruction for all these kids with diverse learning needed
    - I had the developmental background – needed to know about disabilities
    - Paperwork
    - Collaboration – depends on the milieu and teachers that you work with
    - Field experiences helped greatly

FOLLOW-UP #2: HOW WELL-PREPARED DO YOU FEEL FOR BEING AN LBD TEACHER?

    - Very well-prepared based on the the field class where there is hands-on experience, a local mentor teacher within the school and coaching from ABC
    - Very well-prepared because of the quality of the instruction, better than other programs
    - Well-prepared – more than others coming from other programs

3. HOW DID YOU GAIN YOUR KNOWLEDGE ABOUT SPECIAL EDUCATION AND LBD TEACHING PRACTICES?

- The practicum classes
- The professor/college observer coming to school to watch me and model the instruction, mto make sure I understood the content
- Working and taking classes at the same time and seeing the connection
- Specific field experience and on-the-job training working directly with the students
- Access to others teachers who also work with the students
- From the ABC professors via classes, reading materials, practical real-life assignments, e.g.. the parent interview assignment
- Professors and others knowledgeable being able to talk with you

FOLLOW-UP: WERE ANY OF THESE SOURCES MOST IMPORTANT TO YOU?

- Field experiences were the most important – on the job learning
- The practicum classes with the local and Georgetown mentors
- We would read and read, but for me it was doing the assignments and applying what you read
- Online chats also helped for different opinions
- Very organized classes and expectations

4. HOW DID YOUR KNOWLEDGE ABOUT THESE AREAS CHANGE DURING THE PROGRAM?

- By the end of the program, I was very prepared; the [state internship program] portfolio was easy
- I gained a deeper knowledge of my students and my career
- At first I couldn't do an IEP, but then I learned about the integrated report and seeing how my learning could apply to what I was doing in the classroom
- I gained a great deal more knowledge – an overview of special education, disabilities and the laws that accompanied that
- I rely on my colleagues

FOLLOW-UP: HOW CONFIDENT DO YOU FEEL IN APPLYING THIS KNOWLEDGE IN THE CLASSROOM?

- Very confident; two students scored proficient in the on-demand writing.
- This is my 4th year and then I will be tenured; this year my students had 2-3 years of growth – that is phenomenal, pushing them beyond one grade level.
- On a scale of 1-10, an 8 – there are new areas and every child has to be treated as an individual, it is not all in the textbook

5. HOW WELL DID THE LBD PRAXIS TESTING CAPTURE AND REFLECT YOUR KNOWLEDGE

ABOUT SPECIAL EDUCATION AND LBD?

- Passed both
- Written form (Praxis #0542) was right on for LBD
- Multiple choice (Praxis #0353) had a number of things not specific to LBD
- Did better on the scenario because I could elaborate on what I had learned from my teaching
- It was general and broad – we were well-prepared
- For behavior, only experience with behaviors can teach you

6. ARE THERE ANY SUGGESTIONS THAT YOU HAVE FOR THE LBD PROGRAM TO HELP YOU LEARN OR ACQUIRE THIS KNOWLEDGE BETTER?

- More practicum and hands-on as soon as you start the program
- More total practicum hours throughout the program
- Make the behavior management course more real-life, challenging case studies
- More on autism – so prevalent and difficult to understand
- Overall, a great program
- The support and going above the call of duty to help students is a blessing
- Staff of program are gracious and helpful, personalization
- Program is wonderful and would not change hardly anything
- Possibly loan computers or access to those who need it

Focus Group 4 Summary

New to Education, Traditional Practicum Experiences at Time of First Teaching

$n = 3$

INTRODUCTORY/WARM-UP QUESTION

1. WHAT LED YOU TO PURSUE BEING AN LBD TEACHER?

- Came from a business background but always wanted to teach
- Wanted to get a special education credential to extend early childhood degree [no certification]
- In college, worked at Parks and Recreation day camp, liked it and wanted to go into the field

MAIN QUESTIONS

2. WHAT DO YOU BELIEVE YOU NEED TO KNOW TO BEGIN AS AN LBD TEACHER?

- Practical applications of due process, IEP meetings
- Knowing the different disabilities
- Ways to do resource v. pull-out for specific purposes
- Data collection and individual needs
- Understanding the terminology, e.g., acronyms, names of strategies and applications
- Foundations in special education
- Wide range of disabilities – challenging to meet needs of all students
- Good behavior management techniques
- Assessment

FOLLOW-UP #1: ARE ANY OF (THESE) MOST IMPORTANT AS YOU STARTED IN LBD?

- Due process
- Understanding terminology
- Paperwork process
- Final clinical practice (ECE 576) - the actual time and experiences in the classroom

FOLLOW-UP #2: HOW WELL-PREPARED DO YOU FEEL FOR BEING AN LBD TEACHER?

- Prepared by "book-smarts"
- Had to learn the "common sense" areas, e.g., co-teaching with different people
- Did not know anything about AYP (annual yearly progress) and analyzing

school data
- Had to learn district differences and school-specific "rules" in writing IEP's
- Well-prepared after the final clinical practice
- Moderately prepared, but not super great; had student teaching experience in middle school, not at level now
- Understood strategies, but logistics were challenging in knowing how things are done
- Had received clarity on terminology

3. HOW DID YOU GAIN YOUR KNOWLEDGE ABOUT SPECIAL EDUCATION AND LBD TEACHING PRACTICES?

- From the hands-on experiences, "getting my feet wet"
- From the mentors – in the district, ones I sought, ABC, from the state internship program - I was teaching LBD, doing KTIP and completing final clinical practice (ECE 576) at the same time [individual changed status after initial testing]
- Learned as I went, putting together teaching, managing my day, time management
- Definitely the mentors, including individuals that I contacted on my own in my district for specific supports, e.g. reading specialist
- The handouts and websites
- Coursework and student teaching

FOLLOW-UP: WERE ANY OF THESE SOURCES MOST IMPORTANT TO YOU?

- The resources I had – the other teachers at the building, as we became collaborators
- Many mentors out in the field
- Student teaching; would have liked more experience prior to student teaching

4. HOW DID YOUR KNOWLEDGE ABOUT THESE AREAS CHANGE DURING THE PROGRAM?

- During the program, my knowledge grew, e.g., core content, student diversity, differentiation, disabilities, IEP's
- I was able to share my knowledge with my general education teachers at my school as part of collaboration
- Much of the change for me was increasing clarity, especially doing it on a day-to-day basis
- With no education background, knowledge increased

FOLLOW-UP: HOW CONFIDENT DO YOU FEEL IN APPLYING THIS KNOWLEDGE IN THE CLASSROOM?

- I was very confident, until the final clinical practice, "Oh my gosh, I don't know anything!"; but my peers at the school and colleagues encouraged me

and I grew into it
- I feel very confident after the program – from being online, chats with my peers and professors, but mostly from doing it in the field
- Pretty confident; the school I am in now is open to new ideas – we can try them and use another if one doesn't work

5. HOW WELL DID THE LBD PRAXIS TESTING CAPTURE AND REFLECT YOUR KNOWLEDGE ABOUT SPECIAL EDUCATION AND LBD?

    - I did better than I thought. The ABC Praxis preparation sessions and materials helped, the moment of clarity
    - I had studied on my own and attended ABC study sessions – but the multiple choice (Praxis #0353) was totally different, not so much on what I had studied and I had a hard time determining the best answer. I was discouraged when I left the test, but I did pass.
    - The written test (#0542) was much more straight-forward
    - Praxis was good at capturing knowledge taught at ABC, but it was more about what you can retain and recall, rather than apply and analyze

6. ARE THERE ANY SUGGESTIONS THAT YOU HAVE FOR THE LBD PROGRAM TO HELP YOU LEARN OR ACQUIRE THIS KNOWLEDGE BETTER?

    - Foundational information and readings coming into the program for those not from education
    - Role-playing admissions and release committee meetings, as an organizer and facilitator; practice questions
    - Preparation for school "data day" on school data (annual yearly progress, state/federal assessments)
    - Examples of RTI (response to intervention) models in schools, logistics and scheduling
    - How to do collaborative or co-teaching
    - Legalities and due process
    - Learn more about the statewide student data system (special education tab)
    - Glossary of acronyms at the beginning of the program
    - Simple handout on modifications and differentiation
    - More links to preschool applications, not just K-12
    - More about how to teach at the high school level
    - How to complete student teaching, e.g., logistics, trying to work another position at the same time, etc.
    - Having the math course (EDU 509) in a different format, e.g., text chats were not effective
    - Immediate feedback from all professors
    - More experience with behavior management and behavior intervention plans
    - It is an exceptional program and I refer people to it
    - All of the professors wanted us to be successful, very encouraging

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