

Co-Teaching and Collaboration: Preservice Teachers' Knowledge, Attitudes, and Perceived Sense of Efficacy in Teaching Students with Disabilities

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Abstract

A quasi-experimental design and multiple regression analysis were used to examine responses of 153 preservice general and special education teachers as a function of (a) participation in an introductory special education course and (b) viewing a co-teaching video (Friend, 2005) versus observing an inclusive classroom. Based on responses to pre- and post-measures (30 test-bank items, Mastropieri & Scruggs, 2010; Preservice Inclusion Survey, Shippen, Crites, Houchins, Tamsey, & Simon, 2005; and Teacher's Sense of Efficacy Scale, Tschannen-Moran, & Woolfolk Hoy, 2001), results showed participants' knowledge, attitudes, and sense of efficacy increased significantly from pre-to post-course survey ($p < .001$). In addition, participants who viewed the co-teaching video scored significantly higher on self-efficacy ($p = .04$) than those who observed in vivo. However, there were no differences in knowledge or attitudes ($p > .05$) based on video versus observation. Finally, attitudes, but not knowledge, significantly predicted sense of efficacy ($R^2 = .21$). Implications for teacher preparation programs are discussed.

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Codified in the 1997 changes to the Individuals with Disabilities Education Act (IDEA, 1997) and reinforced with the reauthorization of IDEIA in 2004, access to (and progress towards) the general education curriculum for students with disabilities has become a mantra espoused by policy makers as well as general and special educators. Co-teaching generally is considered an effective means of addressing the achievement gap between students with and without disabilities (Friend & Bursuck, 2012) and there is growing consensus that teacher educators must prepare future teachers to collaborate and co-teach (Blanton, Pugach, & Florian, 2011). Research indicates that knowledge, attitudes, and self-efficacy are important factors that predispose teachers to work effectively with students with disabilities (Brownell & Pajares, 1999; Shippen, et al., 2005; Smith, Polloway, Patton, & Dowdy, 2012). However, research on teacher preparation practices that demonstrably influence these factors is limited (Carroll, Forlin, & Jobling, 2003; Freytag, 2001; Sindelar, Brownell & Billingsley, 2010); further, few published studies systematically address all three of these factors in the context of preparation for co-

teaching. This study was designed to investigate, via both experimental manipulation and correlational analyses, the knowledge, attitudes, and sense of efficacy toward co-teaching for both general and special preservice teachers as a function of: participating in an introductory special education course, participating in one of two variations of observing co-teaching, and demographics, including grade level/area of teaching, level of experience, confidence, and interaction.

Students with Disabilities Increasingly in General Education Classrooms

Historically, general and special education teachers provided different instructional services in separate educational settings. Given the accountability mandates and push for a more inclusive service delivery model in The No Child Left Behind Act (2001) and the reauthorization of the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), teachers face enormous pressures. These pressures include ensuring that all students in their classrooms, including students with disabilities, meet the same academic standards, and achieve the same academic outcomes. Because of the increased expectation for students with disabilities to be included in general education classes and focus on access to the general education curriculum, many general education teachers play an increasingly direct role in educating students with disabilities. Additionally, the role of special educators has shifted to include more collaboration and co-teaching with general educators, and less stand-alone instruction of students with disabilities.

For more than a decade, researchers have reported on the growing trend toward educating students with disabilities in the general education setting and have underscored the need for every teacher to be prepared to work with all students (Kavale & Forness, 2000; Mastropieri & Scruggs, 2001). For inclusive policies to be implemented appropriately, general educators must be receptive to the principles and demands of inclusion, and committed to teaching even the most challenging students (Berry, 2010). All educators need to develop awareness of disabilities under IDEIA as well as appropriate instructional and behavioral strategies for each of these disability categories. A major consideration for teacher preparation programs must be how to prepare and motivate both general and special education preservice teachers to meet the educational needs of students with disabilities in increasingly inclusive settings (Swain, Nordness, & Leader-Janssen, 2012).

Collaboration among general and special educators is a necessity for successful inclusion (Smith et al., 2012). Given current legislative mandates, general and special educators can no longer work in isolation. However, there has been a lack of preparation in the areas of co-teaching and collaboration at the preservice level (Conderman, Morin, & Stephens, 2005; White & Mason, 2006). In 2001, the Study of Personnel Needs in Special Education (SPeNSE) showed that less than one third of early career general educators ($\leq$ six years) reported receiving preservice training in collaboration with special education teachers. Further, there is a lack of empirically validated training content in special education preparation (Sindelar et al., 2010). To address this gap, Sindelar and colleagues offered suggestions for future research that included identifying variables that foster high-quality instruction in teacher education programs and examining how entering knowledge and beliefs of preservice students influence their learning. Certainly, general and special education preservice teachers enter the teaching profession with differing knowledge, attitudes, and beliefs that may affect their behavior with students with disabilities, influencing both the classroom environment and student outcomes. Three variables that impact teacher

openness to working with students with disabilities are awareness (knowledge of disabilities, legal requirements, and the provision of effective instructional strategies), attitudes, and sense of efficacy (Brownell & Pajares, 1999; Shippen, et al., 2005; Smith, Polloway, Patton, & Dowdy, 2012).

Awareness

Smith et al. (2012) identified two key barriers that can hinder the successful implementation of inclusive educational practices: *knowledge* barriers and *attitudinal* barriers. Knowledge barriers refer to educators' limited knowledge about the needs of students with disabilities, related policy and legal guidelines, and effective instructional strategies. Cook (2002) found that lack of knowledge about disabilities could affect the tendency of teachers to accept students with disabilities, while limited knowledge can increase the fear and anxiety of working with individuals with disabilities (D'Alonzo, Giordano, & VanLeeuwen, 1997).

In 2005, Shippen and colleagues found that increased knowledge about inclusion gained by participation in an introductory university course on exceptionality changed the attitudes of preservice teachers by significantly decreasing their level of anxiety and hostility toward working with students with disabilities in a general education setting. To determine whether a gain in perceived knowledge changed preservice teachers' attitudes toward inclusion, Gartin, Rao, McGee, and Jordan (2001) surveyed 202 preservice general education teachers enrolled in a three-hour special education introductory course. Results indicated a significant gain in both knowledge of and attitudes about inclusion. Campbell, Gilmore, and Cuskelly (2003) implemented a pre- and post-survey of 274 preservice teachers enrolled in a course that combined formal instruction and field experiences in working with individuals with Down syndrome. At the end of the course, preservice teachers had acquired knowledge of Down syndrome and more positive attitudes toward inclusion. Results also demonstrated that raising awareness of one disability might lead to changes in attitudes towards disabilities in general with preservice teachers reporting greater ease when working with all individuals with disabilities.

There is a perception that special educators have knowledge that enables them to meet the unique needs of students with disabilities. In a study of preservice teachers regarding attitudes about including students with mild disabilities in general education classes (Garriott, Miller, & Snyder, 2003), one teacher noted, "...teachers with regular education classes don't have the knowledge or experience, so the students with learning disabilities should be in special education classes" (p. 51). Garriott and colleagues concluded that in order to alleviate fears and misconceptions preservice teachers have about their abilities to educate students with disabilities, preservice teachers should be provided the knowledge and skills needed to feel competent to accommodate a variety of learning needs. In general, evidence supports providing preservice teachers with knowledge about disabilities and effective instructional practices. However, an even greater challenge for teacher educators may be to affect positive attitudinal change.

Attitudes

A review of the literature confirms the importance of positive attitudes towards inclusive practices (Carroll et al., 2003; Evans, 2004; Garriott et al., 2003). Teachers' attitudes and beliefs can directly affect their behavior with students (Tait & Purdie, 2000; Weiner, 2003). Teachers who are successful in working with students with disabilities tend to believe that learning ability

can be improved and accept the slow, effortful nature of learning for some students (Cook, Tankersley, Cook, & Landrum, 2000; Weiner, 2003). Although very little research has focused on the relationship between personal epistemology and teaching (Kang, 2008), epistemological beliefs (i.e., beliefs about knowledge and learning) appear to mediate attitudes toward inclusion (Silverman, 2007). In a study of 71 preservice general and special educators, Silverman found that preservice educators who had positive attitudes toward inclusion held high-level epistemological beliefs (i.e., belief that all students can learn). In order to foster more positive attitudes toward inclusion, Silverman's findings suggest that preservice teachers' epistemological beliefs about the learning capabilities of students with disabilities should be further explored.

According to Scruggs and Mastropieri's (1996) meta-analytic review of 28 studies involving 10,000 teachers, teachers tend to be supportive of inclusion of students with mild disabilities (i.e., disabilities they understand and believe they know how to address) that require only minor academic assistance and who do not demand a significant amount of the teacher's attention. Teachers who favor inclusion believe that students with disabilities belong in the general education setting (Burke & Sutherland, 2004). On the other hand, teachers who do not favor inclusion tend to believe there are too many demands placed on the general education teacher (Zambelli & Bonni, 2004). These teachers also believe that students with disabilities are better off in a special education setting where they can receive more individualized attention and avoid having a negative impact on the learning of other students within the general education setting (Garriott et al. 2003).

Despite the evidence that attitudes are important, there is minimal research addressing how teacher education programs can promote positive attitudes of preservice teachers toward teaching individuals with disabilities (Carroll et al., 2003). Nonetheless, it has been indicated that teachers with positive attitudes about inclusive practices have confidence in their own abilities to teach students with disabilities (Brownell & Pajares, 1999; Buell, Hallam, Gamel-McCormick, & Scheer, 1999).

Ability or Sense of Efficacy

Consistent with Bandura's notion of self-efficacy (1995), teachers who believe they will be successful tend to set higher goals for themselves and their students, try harder to achieve their goals, and persevere through obstacles more than teachers who are doubtful of their abilities to succeed (Ross & Bruce, 2007). Teachers who possess a higher sense of efficacy generate stronger student achievement than teachers with lower teacher efficacy (Goddard, Hoy, & Woolfolk Hoy, 2004). In an often-cited study, Gibson and Dembo (1984) demonstrated that teachers with strong efficacious beliefs tend to view student failure as motivation to greater teacher effort instead of viewing the causes of students' failure beyond their control; thus, they are motivated to provide additional assistance to students experiencing learning difficulties.

According to Brownell and Pajares (1999), teacher efficacy beliefs significantly affect classroom effectiveness. In their study of 128 general education teachers, they found that teacher efficacy beliefs had a direct effect on their perceived success in teaching students with learning and behavior problems. A high sense of efficacy enables teachers to be less critical of students when they made mistakes (Ashton & Webb, 1986). Such teachers are sensitive to the learning differences of students with disabilities, use their skills to teach students, and believe that

learning will improve (Cook et al., 2000). Teachers with a sense of high efficacy have confidence in their capability to work with students, try new ideas, especially techniques that involve risks, are difficult, and require shared control with the students (Ross, 1998). These teachers stimulate student autonomy by using strategies that keep students on task, and attend more closely to the needs of students with lower abilities (Woolfolk, Rosoff, & Hoy, 1990).

In contrast to teachers with high efficacy beliefs, teachers with low efficacy beliefs give up more easily when students experience academic difficulty because quick results are not evident. These teachers possess a pessimistic view toward student motivation and have a rigid classroom environment (Woolfolk & Hoy, 1990). Teachers with low efficacy beliefs tend to concentrate on the efforts of higher achievers and give less attention to the needs of students with lower abilities and/or achievement, viewing students in this group as potential sources of disruption (Ashton, Webb & Doda, 1983). Freytag (2001) indicated that general education teachers have a lower sense of overall teacher efficacy compared with special educators in inclusive settings. However, Brownell and Pajares (1999) found that general education teachers exhibit confidence instructing and managing students with disabilities if they have taken coursework addressing the needs of students with disabilities, instructional adaptations, and behavior management techniques. Similarly, some researchers have found that limited preparation can heighten fear and reduce general educators' sense of teaching efficacy when faced with inclusive classrooms (Boling, 2007; Hastings & Oakford, 2003).

General education teachers “play a primary role in the education of students with disabilities...[but] often report feeling unprepared to undertake the role” (Brownell, Adams, Sindelar, Waldron, & Vanhover, 2006, p. 171). Sindelar and colleagues (2010) proposed a research agenda for teacher education training with special education focus, paying particular attention to preservice preparation. Consequently, teacher education programs must take steps that afford both general and special education preservice teachers the opportunity to develop knowledge, attitudes, and a high sense of efficacy for teaching students with disabilities. Though most general education preservice students may have limited exposure to special education professors, most preservice preparation programs require at least one course in special education.

The present study was designed to determine whether general and special education preservice teachers' knowledge regarding special education laws, disability characteristics, and best practices, attitudes toward inclusion and co-teaching, and sense of self-efficacy toward educating students with disabilities differed after (a) completing a one semester stand-alone introductory special education course, (b) participating in either a video observation (*Power of 2*, 2nd ed., Friend, 2005) or an in vivo observation of a co-taught class, and (c) as a function of participant's chosen grade level/area of teaching, level of experience, confidence and interaction. The study was undertaken in order to examine the relationships among these variables and to determine the extent to which knowledge and attitudes predict self-efficacy beliefs. Derived from the literature, the specific research questions were:

1. Do the awareness, attitudes, and abilities (sense of efficacy) of preservice educators toward educating students with disabilities improve after participating in a one-semester introductory special education course as measured by a pre-and post survey?

2. Do the awareness, attitudes, and abilities (sense of efficacy) of preservice educators toward educating students with disabilities differ as a function of participation in a one-hour co-teaching video versus in vivo one-hour observation of co-teaching as measured by a pre- and post-survey?
3. Do the awareness, attitudes, and abilities (sense of efficacy) toward educating students with disabilities differ as a function of teaching area (e.g. elementary, secondary), previous interaction with individuals with disabilities, self-reported confidence, and level of experience teaching students with disabilities after participating in a one-semester introductory special education course as measured by a pre- and post-survey.

Method

Participants

Consent was obtained and primary reliability data were collected from 177 participants, 19-53 years of age ($M = 23.12$), enrolled in eight, upper-level undergraduate, introductory special education courses at a large southeastern university during the spring semester of 2011. One of the programs had an intensified urban education focus. Because of the nature and dissimilar requirements of the urban focus course, participants ($n = 19$) were eliminated from the study leaving 158 participants. Of the 158 remaining participants, 153 completed online surveys before receiving instruction in the course and after the course was completed. The introductory special education course targeted for the study was required for all students at the University pursuing initial teaching licensure. Students typically enroll in this course during their third or fourth year of undergraduate matriculation prior to completing a yearlong teaching internship at the graduate level, though a few students each year enroll in the pre-internship courses as post baccalaureate students. The course is one of three “core” courses commonly taken by all education majors and minors. All of the participants were enrolled in courses leading to an education major or minor, prior to a teaching internship.

Of the participants, there were 32 males (20%), and 126 females (80%). The preservice teachers included 13 third year (8%) and 125 (80%) fourth year undergraduates. Twenty (12 %) students were at the graduate level. The preservice teachers were studying the following areas of teacher education: 7 (4 %) early childhood, 67 (42%) primary/elementary, 59 (37%) secondary, 13 (8%) special education, and 7 (4%) other (includes middle grades).

Instrumentation

Participants completed both pre- and post-course online surveys, which consisted of four components: (a) an Attitudes Questionnaire (AQ developed by Authors, 2011), (b) a modified version of the Preservice Inclusion Survey (PSIS developed by Shippen, Crites, Houchins, Tamsey, & Simon, 2005), (c) the Teachers’ Sense of Efficacy Survey (TSES sometimes referred to as the *Ohio State Teacher Efficacy Scale* developed by Tschannen-Moran, & Woolfolk Hoy, 2001), and (d) 30 multiple-choice questions taken from the text test bank (Mastropieri & Scruggs, 2010, *The inclusive classroom: Strategies for effective differentiated instruction*, 4th ed.). Demographic questions were included in the pre-course online survey only.

Two instruments were used to assess preservice teachers’ attitudes. The Attitudes Questionnaire (AQ) used an 8-item Likert-type scale designed to measure attitudes about fairness and meeting

the needs of students with disabilities. Internal consistency reliability of the AQ as determined by alpha coefficient was strong ($r = .83$). For this study, the PSIS was adapted to emphasize collaboration and co-teaching within the one paragraph scenario described as serving students with disabilities in an inclusive classroom, and included the same disabilities as the original form of the PSIS (i.e., learning disabilities, hearing impairments, behavior disorders, and intellectual disabilities). Participants responded to a list of 17 adjectives using a 5-point Likert-type scale (i.e., negative, somewhat negative, neutral, somewhat positive, and positive) to indicate their feelings about collaboration and co-teaching. Positively- and negatively-worded items were counterbalanced. Internal consistency reliability of the PSIS calculated for this sample ($r = .92$) was strong. The Teacher Sense of Efficacy Scale (TSES) measures beliefs in the capability to make a difference in student learning and reach students who are difficult or unmotivated. Internal consistency reliability of the TSES as determined for this sample ($r = .92$) was strong.

To assess preservice teachers' special education knowledge, 30 multiple-choice questions, with four choices, were selected from the course textbook test bank (Mastropieri & Scruggs, 2010). Instructors with experience teaching the introductory special education course were asked to review the test bank items from key chapters and select questions perceived as representative of the most important chapter content. The pool of questions was refined further by the course coordinator and first author using criteria for multiple choice test items (Payne, 2002). Refinement of the question pool resulted in three ten-question sets to assess preservice teachers' knowledge in three distinct areas: legal issues and policies, disabilities characteristics, and teaching strategies.

Demographic information was collected during the pre-course online survey and addressed participants' age, gender, educational status, grade level of expected certification, amount and type of interactions with a person with a disability, amount of training and/or educating students with disabilities, knowledge of special education legislation, level of experience, and confidence in teaching students with disabilities. Internal consistency for the 30-item Knowledge scale was .64 for this sample.

Procedures

Students were assigned to one of two conditions: (a) viewing a one-hour, co-teaching video or (b) observing a one-hour in vivo co-taught classroom through random course assignment. Four instructors taught students in the seven participating sections of the introductory special education course. All instructors use common syllabi (e.g., similar assignments and requirements) and the same course textbook (Mastropieri & Scruggs, 2010). One instructor taught four of the seven sections; therefore, students in two of her sections were assigned to watch the co-teaching video; students in the other two sections were assigned to observe co-teaching in vivo with day and night sections balanced between the condition variables.

Following instructor consent, the first author visited the first class meeting of each course section to introduce the study, acquire consent from participants, and administer the pre-course online survey. Course instructors introduced the class-wide experimental condition (observation or co-teaching video) and provided explanation of the assignment requirements as well as course-wide due dates. In all courses, the observation or video assignment was due approximately two weeks prior to the end of the course.

Based on class assignment, participants in the in vivo observation were supplied with a list of 53 names of effective co-teachers, recommended by several local education agencies (LEA), central office staff, and co-teacher coordinators. Sixty-three participants were matched with one of the names of the effective co-teachers and observed the co-taught classroom for one hour.

Participants contacted the recommended co-teachers and coordinated observations on an individual basis. Seventeen participants did not observe a teacher from the approved co-teaching list. However, a review of the written observation summaries submitted by the participants indicated they had similar experiences. Therefore, for analyses, they were grouped with the participants who did observe a teacher from the approved list ($n = 80$). Seventy-two participants watched the one-hour co-teaching *Power of 2* video (Friend, 2005). One participant did not participate in either assignment (i.e., condition) and was eliminated from the analyses on effects of observation condition. The video offered a comprehensive overview of co-teaching as part of the foundation of an inclusive, collaborative school, and was designed to assist professionals in maximizing student outcomes through classroom partnerships. Video sessions were arranged in the University's main library viewing room. Five different session times were available and students attended the session of their choice.

During the final week of the course (week 18), the first author attended each class to provide instructions for completing the post-course survey. After all surveys were completed, data were downloaded from the online database and analyzed using Statistical Package for the Social Sciences (SPSS) version 18 software.

Results

Characteristics of the distribution of scores on the various dependent variables were evaluated by examining kurtosis and skewness. All scales, with one exception, were generally normally distributed with skewness ranging from $-.76$ to $.26$ and kurtosis ranging from $-.56$ to $+1.02$. To determine if the knowledge, attitudes, and perceived abilities (sense of efficacy) of preservice educators toward educating students with disabilities improved after participating in a one-semester introductory special education course, paired t -tests for equality of means were used to analyze pre- and post-course online survey data. Analyses revealed significant differences between the mean scores of the participants on all dependent variables in the pre- and post-course survey with alpha set at $.05$ (see Table 1). Preservice teachers' knowledge (30 text test bank items) of legal issues, disability characteristics, and instructional strategies significantly increased by the end of the introductory course, $t(152) = -14.28, p < .001$. Preservice teachers' attitudes toward educating students with disabilities (8 item AQ) significantly improved by the end of the course, $t(152) = -6.11, p < .001$. Preservice teachers' attitudes toward collaboration and co-teaching (17-item PSIS) significantly improved by the end of the course, $t(152) = -10.26, p < .001$. Finally, preservice teachers' sense of self-efficacy for working with students with disabilities (12-item TSES) significantly improved by the end of the course, $t(152) = -15.44, p < .001$.

Table 1

Knowledge, Attitudes and Sense of Efficacy Means and Standard Deviations of Preservice Teachers' Pre- and Post-Survey Responses

Variable	Pre-survey	Post-survey
	M (SD)	M (SD)
Awareness/Knowledge	15.86 (3.46)	20.21 (3.16)
Attitude Questionnaire (AQ)	4.62 (0.42)	4.82 (0.31)
Preservice Inclusion Survey (PSIS)	3.46 (0.69)	3.99 (0.60)
Teacher Sense of Efficacy Scale (TSES)	6.80 (0.98)	8.08 (0.70)

Note. N = 153.

To determine if any significant differences exist between the mean scores for participants who watched the one-hour co-teaching video and the mean score of those who participated in a one-hour in vivo observation of a co-taught classroom a series of repeated-measures analyses of variance (ANOVA, alpha set at .05) were used to evaluate differences in knowledge, attitudes (AQ and PSIS), and teachers' sense of efficacy (TSES). Means and standard deviations on the Knowledge, AQ, PSIS, and TSES of the two groups are presented in Table 2.

Results of a repeated-measures analysis of variance (ANOVA) indicated no significant differences in participants' knowledge scores from pre- to post-course online surveys as a function of the observation condition, $F(1, 150) = .101$, $p = .751$. Similarly, results of two ANOVAs indicated no significant differences in participant attitudes (AQ) scores from pre- to post as a function of the observation condition, $F(1, 150) = .224$, $p = .636$ and no significant differences in attitudes as measured by the PSIS, based on video versus in vivo observation, $F(1, 150) = 0.00$, $p = .988$. However, PSIS results indicated a significant difference for the main effect of condition, $F(1, 150) = 6.89$, $p = .010$. Both at pre- and post-course survey, participants who watched the video scored significantly higher on the PSIS, but both observation groups made similar gains. Results of a repeated-measures ANOVA for the TSES indicated significant differences in participant scores from the pre- and post-course surveys as a function of the observation condition, $F(1, 150) = .677$, $p = .042$, $\eta_p^2 = .027$. In sum, results indicate similar gains in knowledge and attitudes for participants in both observation groups. However, participants in the video observation group made greater gains in teacher efficacy (TSES) than those in the in vivo condition.

Table 2
Knowledge, Attitudes, and Sense of Efficacy Pre-and Post-Survey Means Based on Condition

Variable	<u>Video</u>		<u>In Vivo</u>	
	<u>Pre-Survey</u>	<u>Post-Survey</u>	<u>Pre-Survey</u>	<u>Post-Survey</u>
	M (SD)	M (SD)	M (SD)	M (SD)
Knowledge	16.00 (3.48)	20.45(3.65)	15.77 (3.48)	20.03 (2.65)
Attitudes Questionnaire	4.63 (.43)	4.84 (.32)	4.62 (.40)	4.80 (.31)
Preservice Inclusion Survey	3.59 (.63)	4.12 (.53)	3.36 (.72)	3.89 (.61)
Teacher's Sense of Efficacy	6.73 (.96)	8.12 (.73)	6.99 (.98)	8.05 (.68)

Note: N = 152.

To determine if levels of knowledge, attitudes, and sense of efficacy differed at the end of the course based on level of teaching, mean difference comparisons were conducted for 139 participants: 67 primary/elementary preservice teachers, 59 secondary preservice teachers and 13 special education preservice teachers; participants who selected early childhood (n = 7) or other (n = 7) as their level of teaching were not included in the analysis due to small sample size. Means and standard deviations for all three groups on the dependent variables from the pre-and post-course survey are presented in Table 3.

A one-way ANOVA yielded no significant differences in knowledge post-survey scores across the three groups, $F(2, 136) = 1.25$, $p = .289$; similarly, no differences were found in attitudes toward collaboration and co-teaching as measured by PSIS post-survey scores, $F(2, 136) = 1.93$, $p = .148$. Because assumptions of normality were violated for the AQ post-survey, a Kruskal-Wallis analysis of variance was used to examine differences based on level of teaching and results indicated a significant difference, $X^2(2) = 9.183$, $p = .010$. Results of a Mann Whitney U indicated a significant difference between the median score for the primary/elementary group (5.00) and the median score of the secondary group (4.87), $p = .003$. Significant differences also were found on perceived abilities (sense of efficacy) as measured by the TSES post-survey, $F(2, 136) = 6.46$, $p = .002$, $\eta_p^2 = .087$. Tukey's post-hoc comparisons of the three groups indicated that the primary/elementary group ($M = 8.28$) scored significantly higher on the post-survey TSES than did the secondary group ($M = 7.84$), $p = .001$.

Table 3

Knowledge, Attitudes, and Sense of Efficacy Pre- and Post-survey Means and Standard Deviations of Primary and Elementary, Secondary, and Special Education Preservice Teachers

Teaching Area	Pre-survey		Post-survey	
	M	(SD)	M	(SD)
Knowledge				
Primary/Elementary	15.44	(3.43)	20.08	(3.06)
Secondary	16.20	(3.12)	20.35	(3.08)
Special Education	16.92	(4.90)	21.61	(4.11)
Total	15.90	(3.47)	20.34	(3.18)
Attitude Questionnaire				
Primary/Elementary	4.73	(.28)	4.88	(.20)
Secondary	4.41	(.52)	4.70	(.42)
Special Education	4.82	(.22)	4.87	(.19)
Total	4.60	(.43)	4.81	(.33)
Preservice Inclusion Survey				
Primary/Elementary	3.39	(.65)	4.05	(.53)
Secondary	3.35	(.70)	3.84	(.68)
Special Education	3.97	(.67)	4.07	(.54)
Total	3.43	(.69)	3.96	(.61)
Teachers' Sense of Efficacy				
Primary/Elementary	6.78	(1.00)	8.28	(.60)
Secondary	6.77	(.79)	7.84	(.75)
Special Education	6.98	(1.39)	8.09	(.71)
Total	6.80	(.96)	8.07	(.70)

Note: primary/elementary ($n = 67$), secondary ($n = 59$), special education ($n = 13$). Not included were early childhood ($n = 7$) and other ($n = 7$).

Demographic information as well as means and standard deviations of preservice teachers' level of experience, confidence, and amount of interaction with individuals with disabilities are presented in Table 4. Correlational analyses depicting the relations between demographic variables and dependent variables as measured by post-survey instruments are presented in Table 5. Correlations ranged from $-.04$ to $+1.00$; 7 of the 18 relations were significant at $.05$ or greater.

The relation between the two attitude post-measures (i.e., AQ and PSIS) was positive and significant, medium in strength, ($r = .56$, $p = .000$). Though both measure attitudes, the AQ questionnaire targeted the concept of "fairness" for both general and special education students, while the PSIS targeted the emotions of preservice teachers about co-teaching and collaboration. In addition, the relationship between both the AQ and PSIS are positive and medium with the TSES ($r = .41$, $p = .000$, and $r = .50$, $p = .000$ respectively), indicating that positive attitudes are related to sense of efficacy. Knowledge was not found to be significantly correlated with the other dependent measures ($p > .05$).

Results indicated that the TSES post-survey score and self-reported amount of interaction with individuals with disabilities were significantly positively correlated ($r = .16, p = .04$). As the amount of interaction with individuals with disabilities increased, there was a slight tendency for sense of efficacy to increase. Similarly, there was a significant small but positive relation between attitudes as measured by AQ and self-reported level of confidence ($r = .19, p = .02$) and a small but positive relation between the PSIS and self-reported level of confidence ($r = .22, p = .007$). Thus, as attitudes became more positive, so did confidence in teaching individuals with disabilities. Similarly, the relation between attitudes as measured by the PSIS and self-reported level of experience teaching a student with a disability was found to be small but significant ($r = .18, p = .02$), indicating that those who have more experience tend to have more positive attitudes toward including students with disabilities.

Table 4

Demographics (Level of Experience, Confidence and Interaction) of Participating Preservice Teachers Enrolled in a One-Semester Stand-Alone Course

Demographics	<i>n</i>	%	<i>M</i>	<i>SD</i>
Level of experience				
None	81	51		
Little (< 1 week)	35	22		
Some (2-4 weeks)	22	14		
Much (5 weeks >)	20	13		
Total	158		1.88	1.07
Level of Confidence				
Very Low	24	15		
Low	68	43		
Average	47	30		
High	19	12		
Total	158		2.39	.887
Significant/Considerable Interactions				
None	16	10		
Little	60	38		
Some	60	38		
Much	22	14		
Total	158		2.56	.856

Note: $N = 158$

Table 5

Correlation Matrix of Knowledge, Attitudes, Sense of Efficacy, and Demographics (Interactions, Confidence and Level of Experience in Working with Individuals with Disabilities) Based on Post-Survey Results

	Awareness2	Attitude Questionnaire2	Preservice Inclusion Survey2	Teacher Sense of Efficacy Scale2	I have had significant/ considerable interactions with a person with a disability	My level of confidence in teaching students with disabilities	My level of experience teaching a student with a disability
Awareness2	1.00	.14	.11	-.04	.04	.08	.04
Attitude Questionnaire2		1.00	.56**	.41**	.08	.19*	.13
Preservice Inclusion Survey2			1.00	.50**	.13	.22**	.18*
Teacher Sense of Efficacy Scale2				1.00	.16*	.12	.10
I have had significant/considerable interactions with a person with a disability					1.00	.26**	.41**
My level of confidence in teaching students with disabilities						1.00	.23**

My level of experience
teaching a student with
a disability

1.00

**. Correlation is significant at the 0.01 level (2-tailed).

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

N = 153

Results of a stepwise multiple regression analysis indicated the relative predictive power of knowledge and the two measures of attitudes to predict sense of efficacy. Results indicated only one measure contributed unique variance; results of the PSIS explained 21% of the variance on the TSES ($R^2 = .21$, $df(1, 125)$, $p < .05$). Knowledge and attitudes as measured by the AQ did not add significantly to the prediction above the effects of PSIS.

Discussion

Findings of the present study support the notion that participation in a stand-alone, introductory-level special education course can positively influence the knowledge, attitudes, and perceived abilities (sense of efficacy) of preservice teachers (Shippen et al., 2005; Gartin et al., 2001). Unlike most previous studies on preservice preparation for collaborative co-teaching, this study included an experiment, to test effects of watching a video versus in-vivo observation of co-teaching; with results indicating that exposure to the co-teaching video resulted in higher self-efficacy, but not an increase in knowledge or attitudes of preservice teachers. These findings modestly extend the knowledge base about what variables constitute high-quality teacher preparation. Results indicated that simply providing preservice teachers vicarious experiences in collaborating to provide instruction to individuals with disabilities can help preservice teachers build a stronger sense of efficacy toward educating students with disabilities.

Mean difference analyses indicated that knowledge, attitudes, and perceived abilities (sense of efficacy) of preservice educators toward educating students with disabilities differed as a function of teaching level and area. Post-survey responses to items assessing attitudes about fairness and access (AQ) and teacher efficacy (TSES) were significantly higher for preservice teachers preparing to teach at the primary/elementary level than those preservice teachers preparing to teach at the secondary level. Similarly, McHatton and McCray (2007) found differences in perceptions between elementary and secondary preservice teachers after completing a one-semester course. Elementary majors had more favorable perceptions toward inclusion overall, even though both groups were less open to the inclusion of students with particular disabilities (i.e., students with behaviors disorders, intellectual disabilities, and multiple disabilities). In addition, Cook (2002) found that secondary preservice teachers, unlike elementary preservice teachers, were more likely to *strongly disagree* or *disagree* with statements that addressed the benefits of inclusion and the ability to educate students with disabilities within the general education setting. Further attention needs to be devoted in introductory special education courses to provide strategies for addressing the needs of older students with disabilities in inclusive settings.

Surprisingly, in contrast to previous research (Forlin & Chambers, 2011), the 30-item measure of knowledge (legal issues, disability characteristics, and teaching strategies) was not significantly related to any of the other attitude, efficacy, or demographic variables. Interestingly, there was a small positive correlation between self-reported amount of interactions with individuals with disabilities and perceived teacher self-efficacy, but not with other variables. As the amount of interaction with individuals with disabilities increased, the sense of efficacy tended to increase. Similar to previous research (Shippen et al., 2005; Stamopoulous, 2006), there was a small positive correlation between reported level of confidence and attitudes, as measured by the AQ

and PSIS. Finally, there was a small positive correlation between self-reported level of experience teaching a student with a disability and attitudes as measured by the PSIS. In general, the small or insignificant relationships between the demographic variables and the post-survey measures suggest that entering experiences may have a limited impact on knowledge, attitudes, and self-efficacy for preservice teachers who participate in a well-designed, comprehensive course on educating students with disabilities.

Importantly, results of a stepwise multiple regression analysis indicated that emotion-based attitudes as measured by the modified PSIS significantly predicted teachers' sense of self-efficacy toward co-teaching, but knowledge of legal issues, disabilities, and teaching strategies did not add to the prediction. These findings have some parallels to previous studies (e.g., Forlin, Jobling, & Carroll, 2001; Stamopoulos, 2006) which showed that interacting with individuals with disabilities contributed to positive attitudes toward individuals with disabilities, a deeper understanding of diversity, and greater confidence in developing inclusive classrooms.

Limitations

Because data were collected from one teacher preparation program, the nature of the sample in this study limits the generalizability. More importantly, for the pre-post only comparisons, it could not be determined if the results were due to class participation since a control group was not assigned. Furthermore, it cannot be determined what the preservice teachers were doing when they were not in class. Additionally, only 13 participants were seeking special education licensure, limiting findings relevant for special educators in preparation. Despite the fact that most participants in the observation condition observed a class taught by an approved co-teacher, there is no guarantee that the class observed was effectively co-taught during the one-hour observation period.

A variety of survey instruments were used in this study. Although reliability coefficients for all instruments were acceptable, the 8-item AQ was created for this study and has no previous or external validity evidence. The 30 text-test bank questions bear further analysis, given the relatively low internal consistency reliability and correlations between the knowledge items and other variables in the study. Additionally, a significant difference was found on the knowledge portion of the post-survey for participants enrolled in the first author's course section, presumably because the first author was more aware of the specific nature of the knowledge items than the other instructors who participated. Because students were heterogeneously enrolled in the various class sections, this difference presumably would not affect results of analyses with the possible exception of those based on experimental condition.

Future Research

The present study is one of the few studies to include measures of knowledge, attitudes, and sense of efficacy for collaboration and co-teaching to teach students with disabilities and to include both general and special education preservice teachers. A logical next step would be to replicate and extend these findings with a refined knowledge scale and a larger sample of special education preservice teachers. With additional research, the literature suggests connections that may lead to a model for predicting and impacting teacher efficacy, beginning with preservice experiences. Knowledge arguably leads to more positive attitudes (Campbell et. al., 2003, Forlin, et al., 2001; Garriott et. al., 2003), which in turn, contributes to increased self-efficacy. In the

current study, attitudes modestly predicted teacher efficacy, but a more robust measure of knowledge is needed to gain better understanding of these relations.

Additional research is needed to determine the most important content (e.g., knowledge of disabilities, legal and policy issues, teaching methods, and strategies) and the most effective ways to present this content to preservice general and special educators. Researchers should determine what knowledge is most essential for positively impacting attitudes and ultimately building self-efficacy toward the end of producing successful, collaborative educators. Future research should be conducted to examine knowledge, attitudes, and sense of efficacy toward students with other types of disabilities, such as autism, since the PSIS only addressed a scenario that involved individuals with learning disabilities, hearing impairments, behavior disorders, and intellectual disabilities. Furthermore, limited research has focused on both secondary general education teachers and secondary special educators despite the role each plays in educating and influencing students with disabilities. Because of current policy and educational reforms requiring increased graduation rates, school and teacher accountability, and state-mandated assessments, future research is critical in helping determine how to best prepare teachers at the secondary level. Finally, researchers should determine how gains in knowledge, attitudes, and self-efficacy could be maintained and enhanced into internship or student teaching experiences, and teachers' practices.

Conclusion

Results of the present study revealed an increase in the knowledge, attitudes, and sense of efficacy of preservice teachers following participation in a one-semester, stand-alone, introductory special education course. Similar gains were made regardless of exposure to collaborative co-teaching (the observation of a co-teaching video and authentic, in-vivo observation) but self-efficacy was slightly stronger for those who watched the video. Elementary preservice teachers showed more positive attitudes (i.e., views of fairness and emotional receptivity) than their secondary preservice counterparts. Prior experiences with individuals with disabilities had only a small impact on attitudes and sense of self-efficacy by the end of the course. Finally, only emotion-based attitudes significantly predicted sense of self-efficacy.

These findings have several implications in teacher education. Results support the importance of offering courses in special education to all teacher candidates. Previous exposure to individuals with disabilities has a relatively small impact on end of course knowledge, attitudes, and sense of efficacy, implying that teacher education can have a strong influence despite previous exposure. Results also support the importance of attitudes (i.e., being emotionally receptive to collaborative co-teaching, which was the only significant predictor of self-efficacy); teacher educators need to address (implicitly and explicitly) preservice teachers' attitudes. Based on results of this study, a well-produced video could be as effective as or better than in vivo experiences in preparing preservice teachers on the topic of collaboration while requiring limited resources (i.e., time, travel). Interestingly, in this study, knowledge did not predict self-efficacy. In summary, this study provides insights into factors that are key in preparing future educators to work with students with disabilities and it lays the groundwork for future, systematic exploration of these key factors with the ultimate goal of obtaining a clear and applicable understanding of the roles

of knowledge, attitudes, and self-efficacy in preparation of preservice teachers to work effectively with students with disabilities.

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