8-2019

The Effect of Joint Training on Knowledge and Attitudes of Career and Technical Education and Special Education Professionals

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THE EFFECT OF JOINT TRAINING ON KNOWLEDGE AND ATTITUDES OF CAREER AND TECHNICAL EDUCATION AND SPECIAL EDUCATION PROFESSIONALS

by

Crystal Emery

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Special Education

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UTAH STATE UNIVERSITY
Logan, Utah

2019

ABSTRACT

The Effect of Joint Training on Knowledge and Attitudes of Career and Technical Education and Special Education Professionals

by

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Utah State University, 2019

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Concentration in a career and technical education pathway supports job exploration for school-age youth and is correlated with higher levels of full-time employment after high school. This is especially true for students with disabilities. Career and Technical Education (CTE) and Special Education (SPED) professionals have struggled to effectively collaborate to serve students with disabilities. Infrequent and inconsistent communication between CTE and SPED professionals as well as limited time and opportunities for CTE and SPED teacher collaboration are barriers to effective collaboration between these professional groups. Joint training with SPED and CTE teachers may be a crucial component to a successful collaboration process.

The purpose of this research is to explore the effect of joint training with CTE and SPED professionals on their knowledge and attitudes of collaboration in serving students

with disabilities. The hypotheses of this study are that conducting joint training with CTE and SPED professionals may (a) increase participants' knowledge regarding both disciplines, and (b) change attitudes regarding collaboration between disciplines. A nonequivalent control group design was implemented to evaluate the effects of joint training on the knowledge and attitudes of CTE and SPED professionals working in high schools. The activities in this research study involved educating SPED and CTE professionals on working together to effectively serve students with disabilities. The training group participated in a pre-test, a training in the basic concepts of each discipline and collaboration between the two disciplines, and a post-test. The control group participated in only the pre-test and post-test. This study demonstrated that joint training and teaming with CTE and SPED professionals increased knowledge of both disciplines and improved attitudes about collaboration between disciplines. Improved knowledge and attitudes toward collaboration resulted from professionals creating a sense of network and community as they worked in interdisciplinary teams.

(65 pages)

PUBLIC ABSTRACT

The Effect of Joint Training on Knowledge and Attitudes of Career and Technical Education and Special Education Professionals

Crystal Emery

Career and technical education (CTE) is a set of career-focused courses and pathways that provide students with technical skills and knowledge which can lead to future employment and postsecondary education. Concentration in a career and technical education pathway while still in high school supports job exploration for school-age youth and is correlated with higher levels of full-time employment after high school. This is especially true for students with disabilities. Special Education (SPED) is the educational support system for students with disabilities. CTE and SPED professionals have struggled to effectively collaborate to serve students with disabilities. Infrequent and inconsistent communication between CTE and SPED professionals as well as limited time and opportunities are barriers to effective collaboration between these professional groups. Joint training with SPED and CTE teachers may be a crucial component to a successful collaboration process.

The purpose of this research is to explore the effect of joint training and collaborative teaming with CTE and SPED professionals on their knowledge and attitudes of collaboration in serving students with disabilities. The activities in this research study involved educating SPED and CTE professionals in a joint training on working together to effectively serve students with disabilities. Time for collaborative

teaming and strategizing between SPED and CTE professionals was included in the training. Knowledge and attitudes were measured before and after the training. This study demonstrated that joint training and collaborative teaming with CTE and SPED professionals increased knowledge of both disciplines and improved attitudes about collaboration between disciplines. Improved knowledge and attitudes toward collaboration resulted from professionals creating a sense of network and community as they worked in interdisciplinary teams.

ACKNOWLEDGMENTS

I would like to thank the Special Education and Career and Technical Education teachers from the multiple districts that participated in the research for this thesis. I appreciate their willingness to take time out of their already busy schedules to attend the training and open themselves up to the collaborative process. Their feedback was invaluable. I would also like to thank the various district administrators for supporting their teachers' participation. I would like to thank my classmates, especially Tabitha Pacheco, for their support and assistance in completing this project. I would like to thank my committee members Drs. Timothy Riesen and Anne Larson for their support and feedback throughout the project. I would especially like to thank my committee chair and academic advisor Dr. Robert Morgan for his support, encouragement, and assistance in completing this project. The enthusiasm and support of my committee was inspiring.

I give special thanks to my family, friends and colleagues for their encouragement, moral support, and patience as I worked my way through this process. To my sons Timothy and Joshua, thank you for watching over me. To my daughters Dempsey, Grace, and Arie, I offer sincere love and gratitude for being in my corner every step of the way. To my husband, Michael, goes my most heart-felt thanks for supporting and believing in me even when I doubted myself. I am immensely grateful to have you all in my life. I could not have done this without you.

Crystal K. Emery

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Concentration in a career and technical education pathway supports job exploration for school-age youth and is correlated with higher levels of full-time employment after high school. This is especially true for students with disabilities (Wagner, Newman, and Javitz, 2016). Career and technical education (CTE) is defined by the Utah State Board of Education as career-focused courses and pathways that provide students with technical skills and knowledge which can lead to future employment and postsecondary education. Positive postsecondary employment outcomes for students with disabilities resulting from CTE concentration are not typically achieved without effective collaboration between CTE and Special Education (SPED) professionals. CTE and SPED professionals have struggled to effectively collaborate to serve students with disabilities (Schmalzried & Harvey, 2014). Schmalzried and Harvey found that a primary concern was lack of regular and consistent communication between CTE and SPED professionals. Eisenman, Hill, Bailey, and Dickison (2003) found that a primary barrier was limited time and opportunities for collaboration between CTE and SPED teachers. The struggles with communication and collaboration in Utah have impacted access to CTE for students with disabilities (L.Gripentrog, personal communication, September 18, 2018). These issues are critical because students with disabilities need work-based learning experiences during high school to maximize positive post-school employment outcomes (Carter, Austin, & Trainor, 2012).

CTE programs with work-based learning experiences have not been well-utilized by students with disabilities in Utah (L.Gripentrog, personal communication, March 18, 2018). In addition, CTE professionals have reported being ill-equipped to support

students with disabilities (Barton-Arwood, Lunsford, & Suddeth, 2015). CTE teachers in Utah schools reported that SPED professionals lacked understanding of CTE processes and requirements when referring students to CTE (T. Cook, personal communication, April 10, 2018). Effective strategies for communication and collaboration are needed among CTE and SPED professionals to better support students with disabilities in accessing available work-based learning opportunities.

Policies Related to Students in Special Education

Recent legislation has sought to influence collaboration across professional disciplines in an effort to improve supports for secondary-age students with disabilities. The Workforce Innovation and Opportunity Act (WIOA) 2014 Title IV Subtitle B Section 422 amended the Rehabilitation Act of 1973 to add the provision of pre-employment transition services (Pre-ETS). Pre-ETS are important to students with disabilities because they allow access to work-based learning opportunities. WIOA stated, "…each State shall ensure that the designated State unit, in collaboration with the local educational agencies involved, shall provide, or arrange for the provision of, pre-employment transition services for all students with disabilities in need of such services who are eligible or potentially eligible for services under this title" (Title IV Subtitle B Section 422). One of the five required components of WIOA was work-based learning experiences "which may include in-school or after school opportunities, or experience outside the traditional school setting (including internships), that is provided in an integrated environment to the maximum extent possible." The State mandate to collaborate with local education agencies to provide Pre-ETS services has most often been interpreted in practice as collaboration with SPED departments in the local

education agency. However, this interpretation has not taken into consideration the provision of services in an integrated setting to the maximum extent possible as directed in WIOA. Therefore, general educators have been affected by this policy as well. The policy shift toward full inclusion may raise problems given findings that some general education teachers still reported that educating students with disabilities in general education classes was a waste of instructional time (Olson, Leko, & Roberts, 2016).

The Transition Services Mandate, C.F.R. 34 Â§ 300.43 (2017) has also outlined transition planning requirements for educators of students with disabilities. Student transition plans were required to identify post-secondary outcomes for employment and include courses of study that will support those outcomes. CTE concentration is defined as taking three or more high school credits in a single career pathway (Lee, Rojewski, & Gregg, 2016). Therefore, CTE concentration is a viable option for meeting the course of study requirement set out in the transition mandate. Lee et al. (2016) also found that students with high-incidence disabilities who were CTE concentrators were more likely to be employed full time after high school than their counterparts who took fewer CTE credits. Findings from this study showed that concentrating in CTE supported transition to employment for students with disabilities.

CTE programs are available in high schools and offer work-based learning experiences. Based on an interview with the Utah State Board of Education Transition Specialist, CTE programs have been accessed at low rates by students with disabilities in Utah (L. Gripentrog, personal communication, March 18, 2018). The Utah State Board of Education CTE Director reported that CTE teachers were ill-prepared to serve students with disabilities (T. Cook, personal communication, April 10, 2018). These reports align

with the findings by Barton-Arward et al. (2015) who found that many teachers reported being ill-equipped to work with students with disabilities and manage a classroom all at once. The CTE director also noted concerns of CTE teachers that SPED teachers had not been well-informed in the process of helping students fully access CTE opportunities. Of primary concern was the trend that students with disabilities have been referred haphazardly to CTE. This concern is supported by Wagner, Newman, and Javitz (2016) who found that participation in CTE overall did not affect post-school employment outcomes for students with learning disabilities, but concentration in an occupationally specific CTE pathway did have a positive effect. In an interview, the transition coordinator of a Utah high school stated that CTE teachers were hesitant to place students with disabilities in their work-based learning sites for fear of damaging the relationship with employers (S. Williams, personal communication, April 14, 2018). Involvement of Vocational Rehabilitation services (VR) in this collaboration may offer resources to address the concerns of CTE teachers. VR is the state agency tasked with supporting individuals with disabilities in obtaining competitive integrated employment. Resources may include vocational counseling; partnerships with community rehabilitation providers, institutions of higher education, and employers; and support for employers hiring individuals with disabilities.

Effects of Teacher Attitudes on Student Outcomes

Collaboration is needed between SPED and CTE teachers to support students with disabilities in receiving the benefits of the readily available resource of CTE instruction in high school instead of putting the responsibility on SPED teachers alone to provide work-based learning opportunities for their students. However, collaboration may require

a change in "mindset" or teachers' attitude about the achievement and performance potential of students, at least for some educators. Teacher mindset plays a significant role in the success of students with disabilities in inclusive settings. Cassady (2011) cited several research findings about attitudes of general and special educators regarding inclusive education.

> An increased receptivity toward including students with special needs is associated to greater teacher efficacy, higher rates of teacher collaboration, and an increased likelihood to differentiate instruction…Those [teachers] who do not fully agree with inclusion are less likely to individualize lesson plans according to students' needs and are less confident that they can implement the requirements of individualized education plans. When general education teachers have negative attitudes toward inclusion and are unwilling to have students with disabilities in their classroom, they may not provide the necessary supports that would create a beneficial learning environment for the students. (p. 3)

Education, training, and reflection continue to be required to help teachers change their mindset. Morgan (2015) found that both general and special education teachers' internal scripts about disability were a hindrance to full inclusion. "The focus on students' disabilities, rather than abilities and strengths, may hold students back from successful integration in the school community. Lowered expectations deter improved and positive outcomes along with the acceptance of students with disabilities." (p. 7) Later in the article, Morgan stated that "students need access to quality teachers to promote high expectations." (p. 8)

Several studies have identified challenges in co-serving students with disabilities, including inconsistent communication and collaboration between CTE and SPED professionals. For example, Schmalzried and Harvey (2014) reported a need for better understanding by each stakeholder group (CTE and SPED) and how to best serve students with disabilities in CTE. Da Fonte and Barton-Arwood (2017) found that scheduled time for collaborative planning meetings between general and special educators helped capitalize on the combination of the different skill sets of the two groups. Collaborative planning meetings involved targeted planning for the academic success of students with disabilities in general education. Professional development structured in ways that compensated for limited opportunities for teacher collaboration within schools (e.g. co-teaching, scheduled teaming, or shadowing other disciplines) showed the most positive outcomes (Eisenman et al., 2003). Sturko and Gregson (2009) evaluated two training methods to support professional collaboration: classroom training and collaboration groups. The authors found that training courses in a classroom setting focused on building general knowledge of multiple professional disciplines while collaboration groups focused on building knowledge of professional practices and community networks through sharing and support. Although learning happened in different ways with each training method, it was unclear from the research which method or combination of methods was most effective in supporting attitudes of collaboration and knowledge between disciplines. In any case, joint training is needed involving CTE and SPED teachers to promote collaboration and support students with disabilities in transition to adulthood. Additional research is needed to identify the effects of training

CTE and SPED professionals jointly in regard to knowledge gains and attitude shifts in co-serving students with disabilities.

Previous Work - Literature Review

In researching the topic of collaboration between SPED and CTE professionals, I completed a search for relevant literature. To conduct my search, I used the EBSCO Host Database, ERIC, Academic Search Premiere, Education Full Text, Professional Development Collection, Psychology and Behavioral Sciences Collection, Vocational and Career Collection, and reference sections from relevant articles. I included search terms such as: *special education* and *career and technical education* and *barriers or obstacles or challenges; career and technical education* and *inclusion* and *barriers or obstacles or challenges; "career and technical education" or "vocational education"* and *special education* and *enrollment; "career and technical education" or "vocational education"* and *special education* and *professional development.* My research yielded 208 articles. I narrowed the search to 20 articles addressing some aspect of professional development needs of CTE and SPED teachers. From that point, I narrowed the search to nine articles addressing benefits and barriers to inclusion in CTE. After review with a committee member, two articles were chosen to show the benefit of participation in CTE by students with disabilities and one article was chosen to discuss the need to support CTE and SPED professional collaboration in serving students with disabilities. I eliminated the remaining studies because they focused on professional development in general rather than collaboration between the disciplines. The scarcity of research on this topic shows a need for additional research on collaboration between CTE and SPED professionals.

Three studies are reviewed below. In the first study, Wagner et al. (2016) used data from the National Longitudinal Transition Study–2 (NLTS2) to examine CTE course taking patterns of high school students with learning disabilities. In the second study, Lee et al. (2016) examined the effects of CTE concentration in high school on post-secondary work outcomes for individuals with high-incidence disabilities also using data from the NLTS2. Finally, Schmalzried and Harvey (2014) studied perceptions of SPED and CTE professionals on interdisciplinary collaboration and communication.

Wagner et al. (2016) analyzed secondary data from NLTS2 to determine CTE course taking patterns of high school students with specific learning disabilities. NLTS2 included data on more than 11,000 high school students. It involved researchers conducting a telephone survey to former students with disabilities 1 to 8 years out of high school to ask them various questions about their education, employment, and independent living. The Wagner et al. study narrowed NLTS2 participants using three criteria, (a) students identified as receiving services for specific learning disabilities; (b) students attending regular high schools; and (c) students with at least one interview after leaving school, a transcript of high school classes, and a source of data on post high-school employment and CTE course taking. About 480 individuals met these criteria. Researchers utilized propensity score modeling to balance the data for accurate comparison. They tested the effects of taking a few CTE courses in high school versus earning a concentration in CTE on the chances of obtaining full time competitive employment within two years of graduation. Concentration is defined in this study as four or more credits in occupationally specific general education CTE courses.

The results of the study showed that almost all participants (94%) took at least one general education CTE course during high school, but only 36.8% of participants earned a concentration in occupationally specific CTE courses. Overall, 90.4% of youth with learning disabilities had worked for pay at some point since leaving high school, but only 74.2% had worked full time. Propensity-adjusted results showed that general education CTE course-taking did not contribute to higher chance of students with specific learning disabilities finding full-time employment. However, earning a concentration did significantly predict full-time employment in the first two years after graduation.

The Wagner et al. (2016) study emphasized the importance of targeted course taking in CTE to improve post-school employment outcomes. Researchers concluded that transition planning must begin early in a student's education in order to offer sufficient time in the student's course schedule for a concentration in CTE. Authors called for early transition planning so that students could express their post-school goals. As stated in IDEA (2004), transition plans are required to list courses of study needed to support the stated goals. Early transition planning including CTE pathways allows ample time to implement the transition plan effectively during the high school years. In addition to supporting CTE participation, the authors cited the need to support academic success to improve graduation rates among CTE participants with disabilities. By supporting both academic and vocational experiences, students were put on an improved trajectory toward positive post-school employment. Finally, Wagner et al. argued that more research was needed to determine if CTE concentration led to further post-school vocational training and employment in the area of concentration. They also recognized

the need to determine whether the benefits noted for students with specific learning disabilities generalized to students with other types of disabilities.

A study conducted by Lee, Rojewski, and Gregg (2016) also involved secondary data analysis using NLTS2. Researchers used a propensity score analysis with NLTS2 data to examine causal effects for CTE participation on post-secondary work outcomes of adolescents with high-incidence disabilities (e.g., specific learning disabilities, emotional disturbance). The propensity score analysis was used to estimate whether a causal effect existed between CTE participation and post-school employment. Using the estimated propensity scores, two weights were created to estimate the causal parameters of CTE experience. To estimate the average effect on students who were concentrators, a standardized mortality/morbidity ratio (SMR) weight was calculated. To estimate the average treatment effect for both concentrators and non-concentrators an inverse probability of treatment weight (IPTW) estimator was used.

The sample included students with specific learning disabilities and emotional/behavioral disorders who graduated from high school between 2000 and 2005. Cases with missing data were deleted as it was decided not to use a multiple imputation approach to avoid errors in estimation. This resulted in a sample size of 420 cases. Researchers used a propensity score for each case to estimate the probability of CTE concentration improving short term post-school work outcomes. Short term was defined in this study as up to 2 years after graduation from high school. Post-school work experience was categorized in three ways: (a) unemployed (0 hrs per week), (b) part time employment (34 hrs or less per week), and (c) full time employment (at least 35 hrs per week).

The results of the study showed that almost 62% of students who concentrated in CTE in high school were employed full time within the first 2 years after graduation. This is compared to only 40% of students employed full time who did not concentrate in CTE. Students who concentrated in CTE were also less likely to be unemployed or employed part time than their counterparts without concentration. The SMR weight analysis revealed that CTE concentrators had 1.85 times higher odds of being employed full time compared to being unemployed or employed part time combined than non-concentrators. The IPTW weight analysis also revealed a positive influence of CTE concentration on post-school employment. CTE concentrators had 1.82 times higher odds of being employed full time compared to being unemployed or employed part time combined than non-concentrators.

The Lee et al. (2016) study showed positive evidence for a causal relationship between concentration in CTE and successful post-school employment outcomes. Researchers concluded further research is needed on work outcomes such as type of work, wages, and job satisfaction to identify more specific effects of CTE concentration. They also recommended further research on the effects of other types of vocational training such as job coaching, work study, apprenticeships and part time work in comparison to CTE concentration outcomes. Similar to Wagner et al. (2016), Lee et al. cited previous research to underscore the importance of bridging the gap between academic and vocational education in order to make the academic curriculum more relevant and the vocational curriculum more appealing. This supports completion of high school and lessens the status distinction between vocation-bound and college-bound students. Finally, the authors noted the benefit of using IEP transition planning as a

vehicle for exploring and setting vocational goals. In addition, they noted the need for systematic collaboration and communication between special educators and CTE professionals in order to effectively support students with disabilities in concentration in CTE.

These first two studies established the benefit of concentration in CTE for students with disabilities. Their results showed the importance of starting transition planning early enough to put a student on a path to concentration in a CTE discipline. Transition planning must include both special education staff and general education CTE staff to ensure sufficient planning in CTE pathways. Lee et al. (2016) cited the need for improved communication and collaboration between CTE and special educators in co-serving students with disabilities as they work toward a concentration in CTE.

The most relevant study I found regarding collaboration in professional development for CTE and SPED professionals was one conducted by Schmalzried and Harvey (2014). The authors cited multiple studies exploring the critical role CTE can play in transition planning including Test, Aspel, and Everson (2006). Test et al., as cited by Schmalzried and Harvey, suggested that CTE should play a large role in transition services for most students with disabilities. The employment training offered and the expertise of CTE staff in preparing youth for future employment are valuable resources in transition planning. Schmalzried and Harvey found that despite the positive effects of CTE participation by youth with disabilities, the disconnect between CTE and special education was a concern. The researchers surveyed CTE and SPED professionals to examine perceptions held by professionals in each educational setting regarding needs and responsibilities when co-serving students with disabilities.

Surveys were sent to CTE administrators and teachers from six stand-alone CTE centers and special educators and guidance counselors from 43 school districts in Indiana. Respondents included five CTE administrators, 64 CTE teachers, 42 special educators, and 20 guidance counselors. There was a total of 131 usable surveys for analysis which represented an overall response rate of 42%.

Participants were asked when student information was provided to the CTE centers. Most respondents indicated that student information was provided at the beginning of the school year. When asked whose responsibility it was to provide student information to the CTE centers, the results were mixed showing confusion between respondents on who held the responsibility. The disparity in responses was similar when asked about the frequency of communication between special education and CTE. Regular and consistent communication was not evident.

The other topics surveyed were quality of communication, representation by CTE in IEP conferencing, professional development opportunities, and perceptions of roles and responsibilities within the different disciplines. Schmalzried and Harvey found that CTE teachers reported they did not receive adequate information about the students in their classes with disabilities and their needed accommodations. In turn, special educators reported that they did receive adequate information about the students' participation in CTE. All stakeholders agreed that CTE teachers were not regularly invited to attend student IEP meetings. Respondents in both disciplines reported that insufficient professional development regarding the other discipline was being provided. Finally, perceptions of the importance of collaboration between special educators and CTE teachers were positive for both groups. Only 15% of CTE teachers had negative

perceptions of the importance of making adaptations and accommodations for students with disabilities in their classrooms. Overall, CTE teachers reported a sense of responsibility to adapt programs to meet student needs. Responses from special educators were more mixed. Over 40% disagreed that they were responsible for monitoring IEP accommodations and supporting CTE teachers in making them. This result indicated that special educators had mixed feelings of their role in collaboration.

Schmalzried and Harvey (2014) emphasized the need for systematic collaboration and communication between CTE and SPED professionals in order to facilitate successful student participation in CTE. According to the authors, professionals in both disciplines needed better understanding of their roles in the process and the needs of students to collaborate effectively. The authors made three recommendations to improve collaborative practices. First, CTE and high school administrators must work together to assess collaboration perceptions of their local personnel and establish and disseminate policies and procedures specific to students with disabilities in CTE. Second, administrators must create an interdisciplinary team including CTE, special education, guidance counselors, students, and parents. This team would be responsible for (a) CTE representation at IEP meetings; (b) formalized structure for student information sharing; (c) specify the roles and responsibilities of CTE teachers, special educators, and guidance counselors concerning students with disabilities in CTE; (d) implementing professional development opportunities for CTE and special education personnel; and (e) implement formal and informal systems for collaboration and communication between all stakeholders. Finally, further research needs to be completed at the state and local levels in this area to improve decision-making for policy makers in the future.

The Schmalzried and Harvey (2014) study explored gaps in communication and collaboration experienced by SPED and CTE teachers and made recommendations for bridging them. Their recommendations speak to the importance of systematic communication and the critical nature of mutual understanding and collaboration across disciplines. Joint training with SPED and CTE teachers as key participants may be a crucial component to a successful collaboration process.

Purpose Statement and Research Questions

The purpose of this study was to explore the effect of conducting joint training - including collaborative work groups - with CTE and SPED professionals. Joint training was defined as an in-person training including CTE and SPED professionals. Collaborative work groups were defined in this study as individual school teams with both CTE and SPED professionals meeting together to plan and set goals to improve collaboration within their individual school. The content covered strategies and requirements for serving students with disabilities in educational settings and procedures and requirements for students concentrating in CTE as suggested by Schmalzried and Harvey (2014). We hypothesized that joint training with CTE and SPED professionals would (a) increase participant knowledge of both disciplines, and (b) change attitudes regarding collaboration between disciplines. The research questions for this project were:

1. Given teams of CTE and SPED professionals, to what extent will joint training improve participant knowledge of SPED and CTE roles as measured by responses on pre- and post-test measures?

2. Given teams of CTE and SPED professionals, to what extent will joint training improve participant attitudes towards collaboration between disciplines as measured by ratings on pre- and post-test measures?

METHOD

Participants

Participants in this study included CTE and SPED professionals from five school districts in Utah and one charter high school. The training group consisted of teams of professionals from individual high schools. Teams consisted of CTE and SPED teachers from each participating school. Participants enrolled as school teams because CTE classes and pathways were unique at each school. By participating as teams from individual high schools, the knowledge and collaboration exercises were relevant to the work each team performed rather than providing general information that may not be relevant in individual settings. The control group consisted of CTE and SPED professionals from school districts who do not participate in the training.

High schools from seven school districts and two charter high schools in Utah were invited to participate. All major high schools across the seven districts were invited totaling 21 schools. Each charter high school had a small team invited to participate. In all, 23 school teams were invited. Districts were chosen based on recommendations from colleagues in the Division of Services for People with Disabilities (DSPD), the School to Work (STW) program, the Utah State Board of Education (USBE), and Utah State University. Each entity was selected because they had initiated efforts to establish collaboration between SPED and CTE professionals, thus making them prime candidates for the study. The purposive sampling procedure allows the researcher to take advantage

of initiatives underway in these districts. However, the individuals making the recommendations made it clear that none of the districts had developed sophisticated or tested systems of collaboration. Selection of these districts allowed the researcher to conduct the study in environments conducive to developing collaborations among its professionals while assessing knowledge and attitude change in the context of a systems change process.

The next step in sampling included the identification of school teams from any of the districts and charter schools to participate in the group receiving joint training. Teams came from individual schools and consisted of three to six participants including both SPED and CTE professionals. District level CTE and SPED directors were contacted and offered participation in the training for their district. The directors offered participation to SPED and CTE teachers at the school level. Principals at the charter schools were contacted and offered participation in the training for their school. Participation was voluntary. All schools were invited, but teams were self-selected by teachers showing interest in the training. School teams were chosen based on the availability and interest of both sets of professionals in one team.

The control group was chosen using a similar process. SPED and CTE directors from districts not participating in the training group offered participation in the pre- and post-tests to educators. All SPED and CTE teachers were invited, but participants were self-selected by teachers choosing to participate in the measures.

Training Group. Of the 23 schools invited, five high school teams participated in the training (four district teams and one charter high school team) with three to six members in each team. There were 20 participants in the training group with 11 from

CTE and 9 from SPED. All but two participants were licensed to teach in the State of Utah with 12 having traditional and six having alternative routes to licensure. One participant without a teaching license was a Speech and Language Pathologist in a school SPED department and the other was a school transition specialist. Participants in the training group had varied levels of experience: three with less than 1 year, two with 1-2 years, three with 3-5 years, and 12 with more than 5 years of experience. Information on participant level of education was not gathered.

A higher percentage of participants were female with 12 females and eight males. Ethnicity was primarily homogenous with 19 participants identifying as White and one as Asian. Teams missing participants from either of the two professional areas were excluded. General educators with other expertise were also excluded in order to focus on building collaboration between SPED and CTE professionals as recommended by Schmalzried and Harvey (2014) and others.

Control Group. The control group was chosen from high schools in two participating districts that opted not to participate in the training. Participation was voluntary. Demographic characteristics of the control were comparable to the training group. Participants in the control group included 16 high school educators with nine from CTE and seven from SPED. All 16 participants were licensed to teach in the State of Utah with 14 having traditional and two having alternative routes to licensure. Participants had varied levels of experience: two with less than 1 year, one with 1-2 years, three with 3-5 years, and 10 with more than 5 years of experience. Information on participant level of education was not gathered. A higher percentage of participants were

female with nine females and seven males. Ethnicity was homogenous with all 16 participants identifying as White.

Setting

Four training opportunities were offered. The training consisted of two 2-hour sessions at a school or district office most convenient for the team members for two districts. Based on feedback from these initial trainings the length and format of the training was adjusted in order to recruit additional participants. For the third district and the charter high school, training consisted of one 3-hour session at the participating school. The training space included desks or tables to allow participants to take notes and complete the pre- and post-surveys and a projector and screen for visual support of the training material when available. The projector was used in two of the four trainings. The others used printed PowerPoint presentations to follow the discussion due to unavailability of projection equipment. Desks were arranged facing the presenter for the first part of the training. The room was rearranged for small groups for the second half to facilitate collaborative goal setting within the individual teams. In one district training, teams from two schools were present to participate in the training together and they broke out into individual school teams for collaboration. All other teams were trained individually as single teams.

Dependent Variables

Dependent variables consisted of (a) knowledge gained by CTE professionals, (b) knowledge gained by special education professionals, and (c) attitude change of CTE and special education professionals. Variables are defined below.

Knowledge of CTE professionals. Knowledge was defined as professionals' understanding of their own discipline as well as the transition process for students with disabilities and the roles and responsibilities of SPED and CTE professionals.

Knowledge of SPED professionals. Knowledge was defined as professionals' understanding of their own discipline as well as CTE pathways and College and Career Readiness (CCR) planning and the roles and responsibilities of CTE and SPED professionals.

Attitudes of CTE and SPED professionals. Attitudes were defined as professionals' views of interdisciplinary collaboration in providing transition services to students with disabilities.

Response Measurement

Knowledge. To measure knowledge, a pre-test (presented in Appendix A) was administered before the training began with identical measures used for both SPED and CTE professionals. The pre-test involved free response and multiple-choice questions and pertained to knowledge about both disciplines. At the conclusion of each training, a post-test was administered with the same questions in randomized order. The control group was administered the pre-test and post-test without training in between.

Attitudes. To measure attitudes, the same procedure of administering pre- and post-tests was followed with identical measures for the two disciplines. The pre-test, presented in Appendix A, included statements regarding attitudes toward interdisciplinary collaboration in serving students with disabilities. Each statement was rated using a 5-point scale with answers ranging from *Strongly Agree* to *Strongly Disagree*. After the training was conducted, the same statements were administered on a post-test. The post-

test also included questions regarding the usefulness of the training as shown in Appendix A.

Inter-scorer Reliability

The researcher created a master list of possible correct answers for the knowledge-based questions that was used as scoring criteria for the pre- and post-tests. The researcher scored the knowledge-based questions on both the pre- and post-tests. A second independent scorer was trained on the master list by the researcher. The second scorer then scored 30% of the pre- and post-tests using the identical scoring criteria for each question. Inter-scorer reliability was calculated by dividing the total number of agreements by the sum of agreements and disagreements and multiplying the result by 100. Disagreement was defined as a difference in scorers' scores for each question. Inter-scorer reliability was found to be 97%.

Inter-scorer reliability was also calculated for each question. Reliability was 100% on all questions but three. The questions with less than 100% reliability were:

1. Name three things required to be in a transition plan.
2. Name two benefits of CTE completion in high school.
3. List two purposes of the College and Career Readiness Plan.

All three questions were free response questions. Inter-scorer reliability for the first question was 93%, for the second question was 98%, and for the third question was 81%.

Fidelity of Training Implementation

Training was implemented by the student researcher. Training content is described below. A fidelity checklist for implementation of critical training components was created by the student researcher. The checklist was comprised of 12 fidelity items.

The checklist is included in Appendix B. An observer in each training used the checklist to score the student researcher for the presence of each critical item to ensure fidelity of training. Separate training sessions were required for each school district due to the distance between districts. The fidelity checklist helped ensure all participants received the same information. The student researcher achieved an average of 11.25 out of the 12 fidelity items (93.8%).

Experimental Design

A nonequivalent control group design (Martella, Nelson, Morgan, & Marchand-Martella, 2013, p. 153) was implemented to evaluate the effects of joint training on the knowledge and attitudes of CTE and SPED professionals.

Procedures

The independent variable in this study was joint training with school teams made up of CTE and SPED professionals. The duration of the training was either 4 hours offered in two sessions or 3 hours offered in one session. The training content covered strategies and requirements for serving students with disabilities in educational settings from special education and general education perspectives. Collaborative planning and goal setting in individual school teams was also emphasized to support implementation of knowledge and attitudes acquired in the training.

Letter of information and pre-test. Participants were emailed the letter of information as part of recruitment for the study. All participants received the letter of information prior to the first day of training. Before training began participants completed a pre-test measuring knowledge of SPED and CTE processes and attitudes of interdisciplinary collaboration in co-serving students with disabilities. For trainings split

into two sessions the pre-test was administered at the beginning of the first training session. For single-session trainings the pre-test was emailed out a week in advance and collected before the training began. For the control group the pre-test was administered either in person or via email a week before the post-test. This spacing allowed for comparable amounts of time between the pre- and post-test for all groups. Participants who were emailed the pre-test were instructed to complete it based on their current knowledge and not to use internet or other resources to answer the questions.

Training. Training was offered in a classroom setting with a PowerPoint® presentation. For two-session trainings, participants completed the pre-test at the beginning of the first session which took approximately 15 min. Completion of the pre-test was followed by the student researcher conducting 90 min of training to improve knowledge between disciplines. Topics were chosen based on recommendations from Schmalzried and Harvey (2014) and others. Content was chosen to address barriers regarding lack of collaboration time and opportunity, teachers feeling ill-equipped to teach students with disabilities, and poor understanding of the roles and responsibilities of each discipline. Topics related to special education included an overview of the Individuals with Disabilities Education Act (IDEA), legal language and regulations about carrying out services to students with disabilities in least restrictive environments, transition planning, and modifications and accommodations for students with disabilities. Topics related to participation in CTE included definitions of CTE pathways in Utah, procedures and requirements for completion of CTE pathways, work-based learning experiences, and College and Career Readiness (CCR) planning. Slides with discussion questions were interspersed throughout the presentation to offer participants opportunities

to share with each other. Discussion of barriers was one of these slides. Barriers to collaboration were listed by the teams in open discussion with one person per team taking notes. The notes from each team were then emailed to the student researcher for qualitative analysis. The first session ended with 10 to 15 min for additional questions and answers and a brief explanation of the second session.

The second session was held in a classroom set up for small group work. The student researcher provided 60 min of training beginning with a brief review from the previous session. The training began with strategies for CTE teachers to use to effectively communicate and set expectations for students with disabilities in their classroom. Finally, the teaming recommendations offered by Schmalzried and Harvey (2014) were presented as an introduction to collaborative goal-setting. Following the training, a 40-min collaborative planning and goal-setting session took place. Participants broke into individual school teams to discuss implementation strategies for improved collaboration within their school. A PowerPoint® slide with three open-ended questions was displayed to generate team discussions. The questions were:

1. What does communication and collaboration currently look like in your school?
2. What would communication and collaboration look like in an ideal world?
3. What first steps need to be taken to improve communication and collaboration in your school?

Each team discussed the communication and collaboration needs they saw in their school and set two goals to improve communication and collaboration between disciplines in co-serving students with disabilities. One person per team took notes during the discussion.

Once the planning session was complete, participants took 10 min to debrief in the larger group to allow the individual teams to share their plans, learn from others, and ask additional questions. The notes from each team were then emailed to the student researcher for qualitative analysis. The session ended with 10 min for the post-test.

Post-test. The student researcher administered the post-test immediately following the second training session.

Single-session training. In the case of the training that occurred in only one session the pre-test was collected prior to the date of the training. The training time was shortened to three hours with the removal of time for the pre-test, one period of questions and answers at the end of the first session, and the review needed at the beginning of the second session in the two-session model. The overview of IDEA was also made more concise. The rest of the training content was identical to the two-session model. The 3-hour training was broken up into 120 min of training including the discussion of barriers, a 40-min collaborative planning and goal-setting session, and 10 min to debrief in the larger group to allow the teams to share their plans, learn from others, and ask additional questions. The session ended with 10 min for the post-test. The post-test was administered immediately following the training session. The notes on barriers and the collaborative workgroup from each team were emailed to the student researcher for qualitative analysis.

Data Analysis

On the pre-test for both the training and control groups professionals were asked to identify their professional discipline in one of the following categories: SPED or CTE. Data was analyzed by discipline in each group. Knowledge and attitudes were reported

for both the training and control groups. Qualitative data was only collected in the training group.

Knowledge. We used difference scores to evaluate any potential increases between pre- and post-test measures of professionals' knowledge. For scoring the pre- and post-tests, one point was given for each correct answer. For questions with multiple answers, the total point value was higher as one point was given for each correct answer within the question. A mean score for the pre-test and post-test was calculated by discipline by summing the points for correct answers from all participants in each discipline and dividing by the number of participants. Standard deviations for each discipline were also calculated. The mean scores and standard deviations from the pre- and post-measures were analyzed to determine the effect of the training on participants' knowledge. Difference scores (i.e., post-test scores minus pre-test scores) for individual participants were calculated and the mean difference scores from pre-test to post-test were calculated for each profession in both the training and control groups. These difference scores enabled a descriptive measure of the effects of training.

Attitudes. Changes in attitudes were measured by discipline in each group by differences in scores on rating scales in the pre- and post-test measures. The responses in each rating category for the individual attitude questions were tallied. The changes in responses from the pre- and post-measures were compared to determine the effect of the training on participants' attitudes. The student researcher used visual analysis to look for an increase in positive responses (*Agree* and *Strongly* Agree) as well as decreased variability in responses. For question five regarding SPED teachers carrying the

responsibility to provide work-based learning experiences for the scoring was reversed. A positive result was seen when the ratings decreased toward *Strongly Disagree*.

Qualitative Analysis. Several questions were posed for group discussion during the training to gather qualitative information regarding collaborative attitudes and practices. These questions were as follows:

1. How does participation in CTE help schools meet the pre-ets requirements?
2. How do you see IDEA requirements happening in your setting?
3. What are some of the barriers or challenges you face in serving students with disabilities in the general education setting?
4. How do students choose and enroll in CTE pathways in your school or district?
5. What does communication and collaboration between disciplines *currently* look like in your school?
6. What would communication and collaboration between disciplines look like in an *ideal world*?
7. What *first steps* need to be taken to improve communication and collaboration between disciplines in your school?

Each school team was instructed to take notes during two discussions during the training: discussion of barriers (question 3) and discussion of first steps toward improved collaboration (questions 5-7). These notes were then submitted to the student researcher for analysis. A copy of each team's notes on barriers and team collaboration is included in Appendix C. Questions 1, 2, and 4 were posed for open discussion within the training. The discussions and comments during the training were not recorded, but the student

researcher did write down quotes from participants that were relevant to the research questions.

Upon review of student researcher notes and the notes gathered from each team themes were identified. Comments were listed in a spreadsheet and tallied. Similar comments were tallied together. Comments emerging with the highest frequency were identified as common themes in the team discussions.

RESULTS

Effect of Joint Training on Knowledge

Joint training produced increased knowledge scores of CTE and SPED professionals as measured by the mean number of correct answers on the pre-test and post-test compared to the control group. As shown in Figure 1, the mean number of correct answers on the measure of knowledge for both the training and control groups was relatively low on the pre-test. When separated by discipline, SPED professionals scored higher than CTE professionals on the pre-test (M = 11.8 out of 20 and 8.5 out of 20 respectively) with an average difference of 3.3 between disciplines.

The pre-test scores for the training and control groups were comparable. The mean pre-test knowledge score for SPED professionals in the training group was 11.44 correct out of 20 with a standard deviation of 2.07. The mean pre-test knowledge score for SPED professionals in the control group was 12.14 correct out of 20 with a standard deviation of 2.12. The mean pre-test knowledge score for CTE professionals in the training group was 8.55 correct out of 20 with a standard deviation of 1.92. The mean pre-test knowledge score for CTE professionals in the control group was 8.56 correct out of 20 with a standard deviation of 2.35. A varying degree of knowledge in professionals'

own discipline and a low degree of knowledge regarding the opposite discipline resulted in the overall low scores on the pre-test.

On the post-test, the mean knowledge scores increased in the training group and remained relatively stable in the control group. The results were separated by discipline. In the control group, SPED professionals scored higher than CTE professionals similar to the pre-test with a slightly increased difference in mean scores of 4.18. In the training group, the difference in scores between SPED and CTE professionals reduced from 2.89 to 0.4 showing the gap in knowledge between disciplines closing after training.

The mean knowledge score on the post-test for SPED professionals in the training group increased to 16.89 correct out of 20 with a standard deviation of 1.62. The mean score for SPED professionals in the control group increased slightly to 13.29 correct out of 20 with a standard deviation of 2.50. Upon analysis, SPED teachers who missed the questions about hours required for concentrating and completion of CTE pathways on the pre-test often got those correct on the post-test showing evidence of some research and learning happening between the two measures without formal training. The mean score for CTE professionals in the training group increased the most to 16.64 correct out of 20 with a standard deviation of 1.57. The mean score for CTE professionals in the control group increased slightly to 9.11 correct out of 20 with a standard deviation of 2.57. There was no clear pattern found to explain this slight increase. As measured by standard deviations, the variation in scores decreased in the training group and increased in the control group when comparing pre- and post-test results.

A difference score between the pre- and post-tests was calculated for each participant. As shown in Figure 2, the mean difference for CTE and SPED professionals

was positive for both the training and control groups, but there was a larger mean gain in the training group. CTE professionals in the training group showed the most improvement in knowledge with a mean difference of 8.09 compared to SPED at 5.44. Both scores were beyond two standard deviations from the mean showing change beyond typical variability. SPED professionals in the control group showed more improvement in knowledge with a mean difference of 1.14 compared to CTE at 0.56. Both scores were within one standard deviation from the mean. All participants in the training group showed a positive difference score on the post-test compared to the pre-test. The range of difference scores was between 2 and 10 with a median score of 7 for the training group. Nine out of 16 participants in the control group showed a positive difference score. The range of difference scores was between -3 and 6 with a median score of 1 for the control group.

Effect of Joint Training on Attitudes

Table 1 presents attitude ratings of SPED professionals according to each rated item separated by training and control group. As indicated by cells highlighted in green, the effects of joint training produced more frequent positive ratings of attitudes of CTE and SPED professionals regarding collaboration in co-serving students with disabilities with less variability across participants. Additionally, Table 1 shows the frequency of pre-test attitude ratings on questions three, six, seven, and eight for the SPED training group was varied around a neutral rating for both the training and control groups. Both groups showed positive attitudes on questions one, two, four, and five. On the post-test, the frequency of attitude ratings on all questions were primarily above neutral in the positive range for the training group and showed little change for the control group.

Table 2 presents attitude ratings of CTE professionals according to each rated item separated by training and control group. As shown, the frequency of pre-test attitude ratings on all questions for the CTE training group was varied around a neutral rating for both the training and control groups. After the training, the frequency of post-test attitude ratings on all questions were primarily above neutral in the positive range for the training group and showed little change for the control group.

The post-test questions regarding the usefulness of the training were all positive with 55% of participants rating the training as "useful" and 45% rating it as "very useful". When asked if participants would recommend this training to colleagues, 19 answered yes and one did not answer. All participants left with one or two ideas for improving their own practice of collaboration as identified by the last question on the post-test. Examples of individual take-aways are:

- "I will be more comfortable approaching SPED teachers with questions",
- "I will work more with CTE to design a career pathway for SPED students",
- "giving more details for IEPs",
- "I will help students enter and complete CTE pathways", and
- "reach out to CTE for more collaboration"

Qualitative Results

The team collaboration and group discussion yielded several consistent themes. Some showed that positive steps are already being taken toward co-serving students with disabilities. Others showed the frustration teachers experience as they serve students with disabilities.

Barriers to collaboration. Several barriers to collaboration were brought up in discussion during the training. These coincided with the barriers identified by Schmalzried and Harvey (2014). The most consistent barrier reported was lack of time to collaborate. Lack of time was attributed to limitations in contract time, large class sizes, IEPs offered during the day while CTE teachers were in class and unable to attend, short preparation periods, and heavy expectations from administration.

Poor communication was attributed to lack of time by participants. One teacher summed up the sentiment by saying, "communication happens reactively, not proactively in our school." That seemed to carry across all groups. No school team had clear and consistent systems for proactively communicating about students they co-served. Another barrier reported was that professionals in each discipline in high school tend to stay to themselves. Disciplines function as silos rather than as a collaborative group.

Finally, lack of professional development was a strongly stated barrier. This was attributed to lack of time and administrative support. Training participants stated that their schools did not have systems in place to provide sufficient professional development. Teachers with less than two years of experience discussed feeling like they had to fend for themselves to learn all they needed to support their students. A barrier to inclusion expressed by some CTE teachers was lack of training on working with students with disabilities. "Teaching a CTE classroom is like playing whack-a-mole," stated one teacher. CTE classes are already chaotic. Adding a student with a disability without training on how to support them causes extra worry and is overwhelming for the teacher.

CTE educators play an important role in supporting positive post-secondary employment goals for students. Several CTE professionals expressed feeling validated

during this training. Working with students in vocation-focused education felt to them like they were viewed as less important than teachers supporting the college-bound track. This training validated the importance of their work. When asked how CTE pathways could support the pre-employment transition services (pre-ets) requirements it was stated multiple times that "CTE is pre-ets!" and "these (SPED) kids need CTE pathways the most." Both disciplines expressed their interest in the benefit of CTE pathway completion to students with disabilities. School team discussions all included something about working together better as disciplines to get students with disabilities into pathways that would serve them well. Two of the school teams listed learning about current CTE pathways in their school as a first step to better collaboration.

Training together builds bridges and encourages collaboration. One of the most consistent themes emerging from the post-test and group discussion is the need to communicate and collaborate more between disciplines. Several participants expressed gratitude for the time and opportunity to have the two disciplines come together. Others saw the importance of collaboration between disciplines where they previously hadn't. Many individuals reported that reaching out to communicate more frequently and deliberately was something they could change in their own practice. In one training session participants from both disciplines were so excited to have the need for collaboration validated that they created signs with words of agreement and excitement and held them up whenever a topic was raised that resonated with them. While this started as a way for the participants to entertain themselves and stay engaged in a training at the end of a long school day, a sense of camaraderie developed over the course of the training and the playful enthusiasm sparked meaningful discussion between disciplines

where there had been little or no communication previously. Pictures of the signs are included in Appendix D.

One school team was impressed with the importance of having CTE input more deliberately included in student Individual Education Plans (IEPs). A SPED teacher in that group stated, "We don't want the student to define their goals as a special ed student. We want them to define their goals as a whole student and we can't do that without participation of gen ed teachers in IEPs." They discussed how CTE teachers see a different side of students than traditional academic teachers and those observations are missing from student IEPs. That team listed editing their teacher input form for IEP preparation to include questions specific to CTE teachers to gather a more complete picture of each student.

The concept that SPED and CTE could be resources to each other in serving students with disabilities was also a strong theme identified. All four training groups listed regularly scheduled interdisciplinary meetings in their first steps toward ideal collaboration in their school. CTE teachers invited SPED to come into their Professional Learning Community (PLC) meetings to offer training in working with students with disabilities. These conversation topics were supported by the collaboration strategies recommended by Schmalzried and Harvey (2014).

Administrators and guidance counselors need to be stakeholders in this training. Another common point brought up in conversation was that the school teams for training like this needed administrators and guidance counselors included. One CTE teacher stated, "Administration and guidance counselors need to understand everyone's roles better. A system change is required to really improve services for students with

disabilities in high school." The charter school especially had system and administration barriers to effective use of CTE in their school. The teachers questioned, "How do charter schools or schools with limited resources access CTE funding or help students access CTE pathways?" They committed to doing some research to explore this further.

DISCUSSION

This research study sought to assess the effects of joint CTE and SPED training on knowledge of both disciplines and attitudinal change. Given the results, the study demonstrated that joint training and teaming with CTE and SPED professionals increased knowledge of both disciplines and improved attitudes about collaboration between disciplines. Including information on both disciplines ensured that all professionals had a clear and common understanding of each discipline's roles and responsibilities. This effect was shown in the decreased knowledge discrepancy between disciplines on the post-test. The effect was also manifested in discussion between groups during the training as representatives of each discipline acted as a knowledge resource to the other as the different topics were discussed. This effect addressed the concerns raised by Schmalzried and Harvey (2014) regarding confusion of which discipline held which responsibilities. This type of training also helped level out varying degrees of knowledge within the individual disciplines as shown by the decreased variability from pre- to post-test. Planning and goal setting in individual school teams helped set common expectations within each team for communication and collaboration to address the needs in these areas, which was also identified by Schamlzried and Harvey.

The changes in attitudes were subtle, but consistent. Both groups started with more positive attitude ratings than anticipated by the researchers so there was not as

much room for change as expected. This supports the finding of Morgan (2015) that many professionals support inclusion as a philosophy but are unsure how to implement it in practice. Despite the subtlety of the attitude change, a clear improvement was noted. As supported by Sturko and Gregson (2009), improved attitudes toward collaboration resulted from professionals creating a sense of network and community as they worked in interdisciplinary teams.

Future Research and Implications

Given that this research study demonstrated joint training with CTE and SPED professionals improved shared knowledge and attitudes toward collaboration, this approach may serve as a valuable tool in improving collaboration between professionals who support students with disabilities in high school settings. Both disciplines have roles and responsibilities related to transition. Improved communication and collaboration between the disciplines created a positive working relationship between professionals and will likely result in a smoother and more comprehensive transition experience for the students they serve based on the conversations observed between disciplines during the training. Multiple participants commented that training had formed a bridge between these two disciplines that did not previously exist.

Although this study demonstrated benefit to training CTE and SPED professionals, the barriers to collaboration may also lie with administrators and school systems. Schmalzried and Harvey (2014) found that most front-line staff were often willing to collaborate but did not have systems in place to do so. They suggested that administrators put those collaborative systems and expectations in place.

Future research could examine the benefit of including administrators as well as guidance counselors as primary stakeholders in the collaborative teams. Administrators need to put the systems in place and set expectations for performance of school personnel (Schmalzried & Harvey, 2014). If systems and expectations do not support inclusive practices and collaboration, then training front-line staff may not have an impact on these practices. Guidance counselors are responsible for course choices and transition planning for the student population. Their input for students with disabilities is often minimal or completely lacking. In an interview, a guidance counselor from a Utah high school stated that in CCR planning with students with disabilities, guidance counselors defer to SPED teachers for course planning and are rarely involved in IEP transition planning (R. Smith, personal communication, October 8, 2018).

Another area of possible future research may be comparing the classroom training to the collaborative teaming to determine which has the stronger impact on attitude and knowledge change. Does the use of both in one package provide a stronger benefit over one or the other individually? Finally, it will be important for future research to assess the effect of successful interdisciplinary training and collaboration on student transition processes and outcomes. Will improved relationships between professionals in the transition process translate to benefits for the students? Further research could also be done to determine if a systems change approach starting with administrators would be more effective.

Limitations

One limitation of this research study was the small number of school teams participating. Although we saw dramatic effects of the intervention within the training

group, individual team improvements may not generalize to all personnel within a school or district who work with SPED and CTE. Similarly, these results may not generalize to teams in other parts of the country. Future research may want to consider utilizing a larger sample size. A second limitation was the lack of systematic random assignment of participating teams to training conditions. Nonrandom assignment may have created bias among researchers or participants in terms of expected responses, thus affecting results. Self-selected participants already show a bias toward wanting to improve knowledge because they chose to participate in the training. Future research should consider random assignment of teams.

A third limitation of this research study is the way some of the pre- and post-test questions were worded. The open-ended free response questions were open to too much interpretation to be scored reliably. The language should be changed to be more specific or the questions should be omitted. This especially applies to the question about the purpose of CCR planning. That question showed only 81% inter-scorer reliability.

Another possible limitation was the procedure of administering the pre-test approximately one week before the post-test. This gave participants an opportunity to research answers to the knowledge questions before participating in the post-test which could skew the results. To mitigate this, participants in the control group were given similar time between the pre- and post-test so comparisons of knowledge gains would be most relevant.

CONCLUSION

Results of this study demonstrate that relatively brief joint training can produce improvements in knowledge and attitudes regarding the roles of professionals in CTE and

SPED. Increased collaboration and improved attitudes between disciplines are important to facilitating delivery of services. Action steps identified by participating teams centered around collaboration. Both disciplines left viewing the other discipline as a resource in their work with students with disabilities. Interest in using the opposite discipline for professional development opportunities and in meeting regularly to team about specific students they are co-serving were prominent action items. The ultimate benefactors may be students with disabilities who receive better coordinated services leading to improved post-school outcomes.

REFERENCES

Barton-Arwood, S., Lunsford, L., & Suddeth, S. W. (2016). University-community partnerships in teacher preparation: Changing attitudes about students with disabilities. *Journal of Public Scholarship in Higher Education, 6,* 4-20.

Carter, E. W., Austin, D., & Trainor, A. A. (2012). Predictors of postschool employment outcomes for young adults with severe disabilities. *Journal of Disability Policy Studies, 23*(1), 50-63.

Cassady, J. M. (2011). Teachers' attitudes toward the inclusion of students with autism and emotional behavioral disorder. *Electronic Journal for Inclusive Education*, *2*(7). Retrieved from http://corescholar.libraries.wright.edu/ejie/vol2/iss7/.

Da Fonte, M. A., & Barton-Arwood, S. M. (2017). Collaboration of general and special education teachers: Perspectives and strategies. *Intervention in School and Clinic, 53*(2), 99-106.

Eisenman, L., Hill, D., Bailey, R., & Dickison, C. (2003). The beauty of teacher collaboration to integrate curricula: Professional development and student learning opportunities. *Journal of Vocational Research, 28*(1), 85-104.

Individuals with Disabilities Education Improvement Act of 2004, 20 U.S.C. §§ 1400-1482 (2012).

Lee, I. H., Rojewski, J. W., & Gregg, N. (2016). Causal effects of career-technical education on postsecondary work outcomes of individuals with high-incidence disabilities. *Exceptionality, 24*(2), 79-92.

Martella, R. C., Nelson, J. R., Morgan, R. L. & Marchand-Martella, N. E. (2013). *Understanding and interpreting educational research*. New York: Guilford Press.

Morgan, P. S. (2015). General and special education high school teachers' perspectives of full membership for students with disabilities. *Values and Ethics in Educational Administration, 11*(3), 1-9.

Olson, A., Leko, M. M., & Roberts, C. A. (2016). Providing students with severe disabilities access to the general education curriculum. *Research and Practice for Persons with Severe Disabilities, 41*(3), 143-157.

Schmalzried, J. E., & Harvey, M. W. (2014). Perceptions of Special Education and Career and Technical Education collaboration and communication. *Career Development and Transition for Exceptional Individuals, 37*(2), 84-96.

Sturko, P. A., & Gregson, J. A. (2009). Learning and collaboration in professional development for career and technical education teachers: A qualitative multi-case study. *Journal of Industrial Teacher Education, 45*(3), 34-60.

Transition Services Mandate, C.F.R. 34 Â§ 300.43 (2017).

U.S. Department of Education. (2018) Individuals with Disabilities Education Act. Retrieved from https://sites.ed.gov/idea/about-idea/.

Wagner, M. M., Newman L. A., & Javitz, H. S. (2016). The benefits of high school Career and Technical Education (CTE) for youth with learning disabilities. *Journal of Learning Disabilities, 49*(6), 658-670.

Workforce Innovation and Opportunity Act, Public Law 113-128, 29 U.S.C. §§ 3101, Title IV Subtitle B Section 422 (2014).

Table 1. *SPED Participant Ratings of Attitude Toward Collaboration on each Measured Item*
Ratings: 1 – Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly Agree

		SPED TG Pre					SPED TG Post					SPED CG Pre					SPED CG Post				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	**General education teachers should attend and participate in IEP meetings.**	-	-	-	1	8	-	-	-	1	8	-	-	-	-	7	-	-	-	-	7
2	**Guidance Counselors should attend and participate in IEP meetings.**	-	-	-	4	5	-	-	-	3	6	-	-	1	2	4	-	-	2	3	2
3	**Students with disabilities should participate in CTE curricula alongside their typical peers in general education classrooms.**	-	-	-	4	5	-	-	-	2	7	-	-	-	1	6	-	-	-	1	6
4	**Students with disabilities (including significant disabilities) typically have plans for education and paid employment after high school.**	1	2	-	4	2	-	3	1	2	3	-	2	2	3	-	-	1	1	4	1
5	**SPED teachers are primarily responsible for work-based learning experiences for students with disabilities.**	1	5	1	2	-	-	5	2	2	-	-	6	1	-	-	-	2	3	1	-
6	**All disciplines are responsible for initiating communication regarding students with disabilities being co-served.**	1	-	1	4	3	-	-	-	2	7	-	-	-	3	4	-	-	-	3	4
7	**I have sufficient information to support students with disabilities participation in general education CTE pathways.**	-	2	4	3	-	-	-	2	7	-	-	2	1	4	-	-	1	2	3	1
8	**I am confident in participating in interdisciplinary collaboration to serve students with disabilities.**	-	-	1	5	3	-	-	-	4	5	-	1	1	2	3	-	-	3	2	2

Table 2. *CTE Participant Ratings of Attitude Toward Collaboration on each Measured Item*
Ratings: 1 – Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly Agree

		CTE TG Pre					CTE TG Post					CTE CG Pre					CTE CG Post				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	**General education teachers should attend and participate in IEP meetings.**	-	-	-	6	5	-	-	-	3	8	-	-	1	6	2	-	-	1	3	5
2	**Guidance counselors should attend and participate in IEP meetings.**	-	-	1	5	5	-	-	-	3	8	-	-	1	3	5	-	-	2	3	4
3	**Students with disabilities should participate in CTE curricula alongside their typical peers in general education classrooms.**	-	2	2	4	3	-	-	-	2	9	-	-	1	3	5	-	-	2	5	2
4	**Students with disabilities (including significant disabilities) typically have plans for education and paid employment after high school.**	1	6	2	2	-	1	-	2	4	4	-	3	5	1	-	-	2	4	3	-
5	**SPED teachers are primarily responsible for work-based learning experiences for students with disabilities.**	-	2	5	3	1	1	7	2	1	-	-	5	3	1	-	-	3	2	3	-
6	**All disciplines are responsible for initiating communication regarding students with disabilities being co-served.**	1	-	1	7	2	-	-	-	3	8	-	-	2	4	3	-	-	1	2	6
7	**I have sufficient information to support students with disabilities participation in general education CTE pathways.**	1	2	2	6	-	-	-	1	7	3	-	1	3	5	-	-	2	4	2	1
8	**I am confident in participating in interdisciplinary collaboration to serve students with disabilities.**	-	2	2	6	1	-	-	-	7	4	-	2	3	3	1	-	1	4	2	2

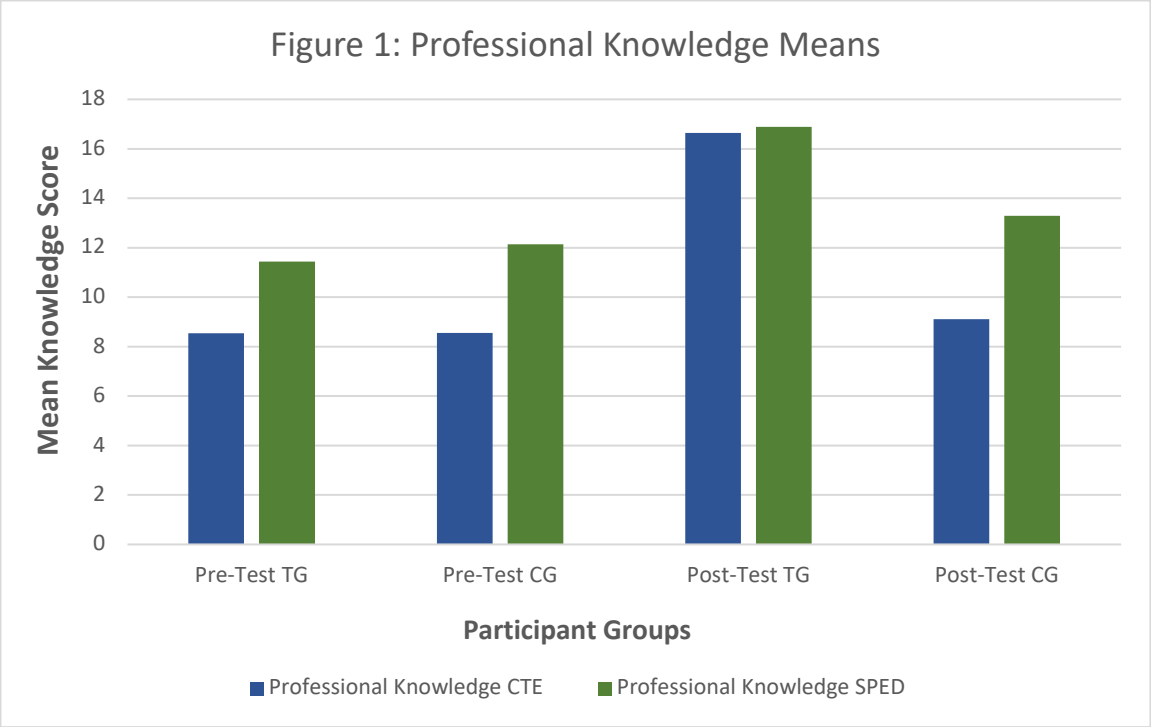

Figure 1. Mean knowledge scores from pre-test and post-test showing effect of training on professional knowledge.

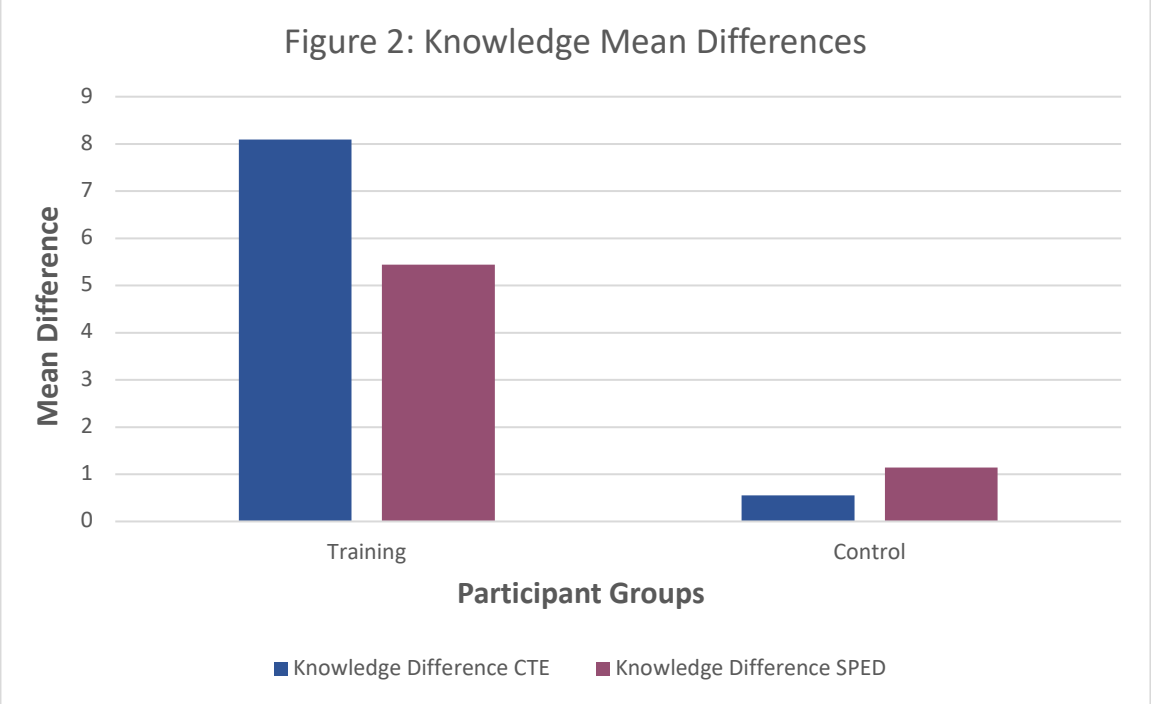

Figure 2. Mean differences between pre-test and post-test scores by discipline comparing training and control groups.

APPENDICES

APPENDIX A

Pre-Test / Post-Test Measure

Identify your discipline: CTE SPED School Name: _____

How long have you worked in a high school setting?

Less than 1 yr 1-2 yrs 3-5 yrs More than 5 yrs

Ethnicity (please circle 1)

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latino
- Native Hawaiian or Other Pacific Islander
- White

Gender (please circle 1)

- Male
- Female

Select your age range: 20-29 30-39 40-49 50-59 60+

What licensure or endorsement do you carry?

What age does transition planning begin in Utah?

Name three things required to be in an IEP transition plan.

1.
2.
3.

Who is responsible for identifying needed accommodations for individuals with disabilities in the general education classroom?

How many credits are required to qualify as a completer and a concentrator respectively in CTE in Utah?

Completer:

Concentrator:

Name two benefits of CTE completion in high school.

1.

2.

List two purposes of the College and Career Readiness plan?

1.

2.

Who is responsible for CCR planning for students with disabilities?

The role of the General Education teacher is to: (multiple choice – circle all that apply)

A. Provide instruction in the core curriculum in a specific educational domain
B. Implement accommodations and modifications for students with disabilities in general education classrooms
C. Provide information on the student's present levels of functioning for the IEP
D. Refer students with disabilities to special education to modify the class curriculum as stated in the IEP

The role of the Special Education teacher is to: (multiple choice – circle all that apply)

A. Serve students with disabilities only in special education classrooms
B. Determine accommodations and modifications for students with disabilities in general education classrooms
C. Implement accommodations and modifications for students with disabilities in general education classrooms
D. Support general education teachers in serving students with disabilities in general education classrooms

Rate each of the following statements:

General education teachers should attend and participate in IEP meetings.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Guidance Counselors should attend and participate in IEP meetings.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Students with disabilities should participate in CTE curricula alongside their typical peers in general education classrooms.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Students with disabilities (including significant disabilities) typically have plans for education and paid employment after high school.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Special Education teachers are primarily responsible for work-based learning experiences for students with disabilities.

Strongly Disagree Disagree Neutral Agree Strongly Agree

All disciplines are responsible for initiating communication regarding students with disabilities being co-served.

Strongly Disagree Disagree Neutral Agree Strongly Agree

I have sufficient information to support students with disabilities participation in general education CTE pathways.

Strongly Disagree Disagree Neutral Agree Strongly Agree

I am confident in participating in interdisciplinary collaboration to serve students with disabilities.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Post-Test Only

Rate the usefulness of this training.

Not Useful Somewhat Useful Useful Very Useful

Would you recommend this training to colleagues in your specialty? Yes No

Why/why not?

What would you do to improve this training?

How will this training change the way you provide supports to students with disabilities?

APPENDIX B

Fidelity of Training Implementation Checklist

1. Did the presenter greet participants and introduce the training?
2. Did the presenter administer the pre-test before beginning the content of the training?
3. Did the presenter review training objectives?
4. Did the presenter define IDEA requirements for transition planning?
5. Did the presenter discuss accommodation and modification planning?
6. Did the presenter define requirements and processes for concentration in CTE pathways?
7. Did the presenter discuss how CTE pathway planning may inform the courses of study listed in a student's transition plan?
8. Did the presenter converse and ask questions to encourage participant engagement?
9. Did the presenter facilitate the participation of school teams in a collaborative planning and goal-setting session?
10. Did the presenter offer time for questions and answers at the end?
11. Did the presenter administer the post-test at the end of the training?
12. Did the presenter close the training by thanking the participants?

APPENDIX C

Individual School Team Notes

School Team 1 Barriers List

- Knowing how to work with students that have reduced assignments
- Spending adequate time teaching the students with disabilities
- Class sizes
- Worrying about the safety of all students and students with disabilities with some of the dangerous equipment
- Gen ED teachers are:
    - Unsure how to accommodate appropriately
    - Unsure what's expected of them
    - May think a student's IEP is a free pass
    - Don't recognize SPED teachers expertise
    - Unwilling to come to IEPs

School Team 1 First Steps Toward Ideal Collaboration

- Edit form that gathers information from teachers before the IEP so that we can get more valuable information from our CTE teachers.
- Invite the CTE department to a joint PLC meeting.
- Include specific CTE teachers in the IEP meeting for students that have declared a CTE pathway.

School Team 2 Barriers List

- Lack of knowledge of pathways - how to get in, what do they do?
- Students not being able to use tech appropriately to accommodate for themselves

- Accommodations not being appropriate?
- Community and Parent attitudes and opportunities
- System failing students - are graduation requirements appropriate?
- How to challenge students with IEP's at their own level - differentiating
- Attendance / non-attendance
- Work-based learning - we have it but how can we make it better?
- CAPS (student information system)

School Team 2 First Steps Toward Ideal Collaboration

- Print out of updated pathways for reference
- Meet once a quarter with SPED & CTE to team about kids and how things are going with co-service
- Get more information about next steps / requirements for after high school (GPA, College, trade school etc.)
- Incorporate skills from CTE into academics to make academic learning more relevant

School Team 3 Barriers List

- Time
- Training /professional development
- Full inclusion/participation within the classroom
- Kids not aware of how to interact with a gen ed teachers i.e. preparation
- Students really behind in certain skills that are needed for the class so they shut down
- Access to materials at the appropriate level i.e. textbooks

- IEPs held in the middle of the day when Gen Ed teachers are unavailable
- Communication in terminology and language that everyone can understand

School Team 3 First Steps Toward Ideal Collaboration

- After receiving email containing IEP, CTE teachers can read the accommodations and discuss them with the student,
- Set up a meet and greet PLC once or twice a semester with both disciplines,
- Collaborate with district transition specialist,
- SPED put together a book list for CTE with examples of books at each reading level.

School Team 4 Barriers List

- Parental expectations
- Time
- Communication
- Knowing which students are in SPED
- Are IEPs written to be enforcable?
- Unclear modifications amd accommodations
- IEP meetings in the middle of the day
- Knowing how to work with the students
- Not knowing what SPED can support
- Powerschool – student information documentation system
- Administration expectations
- Use of deficit-based language when discussing students with disabilities
- Students with disabilities not participating in IEPs

School Team 4 First Steps Toward Ideal Collaboration

- Share information about discipline specific projects (scope and sequence) with other disciplines. Do they overlap and provide opportunities for collaboration?
- Fix faculty meeting to include more relevant training
- CTE and SPED schedule a regular time to meet and team
- Look at possible pathways for the school
- Identify students who would benefit from CTE pathway completion

APPENDIX D

Teacher Participation Signs