PROGRAM PERSONNEL'S VALUE OF DIGITAL AGE SKILLS IN COMPREHENSIVE TRANSITION PROGRAMS

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by

Sara E. Dempster

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DEDICATION

To Granny Wanda, I so wish you could have been here to see me achieve this milestone, but I know that you were watching over me and guiding me until the very end of this journey. To mom and dad for instilling in me the importance of hard work and dedication. For inspiring me to work hard to make you proud. To Jeffrey, for encouraging me to take much-needed breaks and providing comic relief when I needed it. To Aunt Laurie, for being my best friend. For always opening your home when I needed a quiet space to work or just needed a distraction. To Granny and Gramps for being my favorite cheerleaders. To my entire extended family. Thank you for your continuous love and support. I would not be who I am and where I am today without all of you.

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ABSTRACT

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Technology for education has been studied in a variety of settings related to kindergarten through twelfth-grade classrooms, early childhood settings, higher education settings, and settings related to individuals with intellectual and developmental disabilities. With the development of a growing number of comprehensive transition programs across the country, more individuals with intellectual disabilities have the opportunity to participate in postsecondary educational opportunities. There has been limited research focused on the use of technology and digital-age skills within comprehensive transition programs designed to provide support and services to individuals with intellectual disabilities. This quantitative study explored the value placed on digital-age technology skills by individuals who work in comprehensive transition programs across the country. The participants completed an electronic survey focused on digital-age technology skills based on the ISTE standards for students. Through the study, the researcher determined the highest rated digital age skills and the relationship between participant or program characteristics and the value participants have for various digital-age technology-related skills. Findings provided insights that may lead to the development of resources and support for comprehensive transition program personnel and students.

KEY WORDS: Comprehensive transition programs, Technology for individuals with intellectual disabilities, Postsecondary programs for individuals with intellectual disabilities.

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CHAPTER I

Introduction

Adult learners over the age of 18 with intellectual disabilities (ID) and who are enrolled within university programs have various needs that may differ from those of traditional college students. In the past, many postsecondary institutions were not equipped to address the needs of a diverse population of students, such as those with ID (Jaeger, 2004). As a result, there were few opportunities for this population of students to participate in postsecondary education beyond their high school experience. Over the past several years, programs have been developed that provide postsecondary opportunities for students with ID (Papay & Griffin, 2013). Several United States Department of Education recognized programs, referred to as a Comprehensive Training Program (CTP), have been established to provide support services to this population of students. Additionally, Think College is a national organization focused on providing information and resources for individuals with intellectual and developmental disabilities related to postsecondary education (Think College, n.d.-d). As reported by Think College, there are currently over 260 approved CTPs that provide postsecondary educational opportunities for individuals with ID (Think College, n.d.-a). Within these CTPs, students with ID must meet specific academic requirements as well as employment preparation requirements. Students enrolled in CTPs are also expected to meet some of the same requirements as other college students with the support and services provided by program personnel (Think College, n.d.-b; Think College, n.d.-d). An overall goal of CTPs is to teach and facilitate the development of independent living, social, and job-related skills needed for students to become independent and productive members of society (Think College, n.d.-

c). Like other college students, these students often use a variety of technological devices and applications to successfully complete coursework such as electronic communication, clickers or response devices, digital textbooks, learning management systems, online assignment submission, quizzes and tests, personal and university provided devices, videos and other technology depending on the university or specific course (Damewood, 2016; Fathema et al., 2015; Fichten, et al., 2018). Given the bulk of research, it could be suggested that CTPs provide support and ensure that the students served can utilize the technology needed to access information and resources as a university student and in the future as a member of the twenty-first century society.

The International Society for Technology in Education (ISTE) standards for students serve as a guide to promote the use of technology in a way that supports the learning and growth of students of all ages and abilities (International Society for Technology in Education [ISTE], n.d-b). Within a CTP setting, the ISTE standards provide a guide to help students with ID develop skills needed to successfully operate in the current technology-driven society. This study seeks to understand the value CTP personnel place on technology related skills within this type of program.

Statement of the Problem

To promote the meaningful use of technology in educational settings ISTE was established. An extensive review conducted by ISTE leaders concluded that effective use of technology included students acting as empowered learners, digital citizens, knowledge constructors, innovative designers, computational thinkers, creative communicators, and global collaborators (ISTE, 2016). According to the 2017 United States Office of Educational Technology Plan:

> Research and development should be conducted that explore how embedded assessment technologies such as simulations, collaboration environments, virtual worlds, games, and cognitive tutors can be used to engage and motivate learners while assessing complex skills. Although some of this research is in its early stages, the way forward will require close collaboration among organizations . . . colleges, universities, informal learning spaces, and schools; philanthropic organizations; and research institutions . . . This collaboration can lead to the development of more effective and engaging experiences to support learning. (U.S. Office of Educational Technology, 2017, p. 67)

This statement further supports the need to study the implementation of technology and related skills with diverse groups of populations such as individuals within a CTP setting. Now that many established CTPs have been in operation for several years, more research should focus on how these standards for technology use can benefit students in programs like those associated with Think College.

There is a gap in the research on the value program personnel who work in CTPs as directors, developers or coordinators, staff, teachers, peer mentors, or graduate assistants have for the skills addressed in the ISTE standards. Due to program personnel's level of interaction with students enrolled in a CTP, these individuals have insight into the skills that would be most beneficial for CTP students to master. Determining the ISTE standard skills selected as important by individuals who work within a CTP can inform future program design and the development of resources related to technology related skills that are specific to CTPs.

Purpose of the Study

The purpose of the study was to examine the digital-age skills identified as valuable by individuals who work in a CTP. A secondary purpose was to determine if any correlation exists between the skills identified as important and characteristics of the participants or programs. The researcher sought to determine the skills identified as valuable by this group of individuals to increase the resources and support related to the use of technology among students with ID enrolled in a CTP. The development of resources and support for personnel and students within these programs will ensure that students can not only use the required technology within a postsecondary and CTP setting but are also able to locate and utilize other technology that will contribute to their overall success throughout the program and beyond.

The researcher sought to answer the following questions with the data collected from a survey completed by personnel who work with individuals in this type of program:

1. How are ISTE standard related digital skills rated by CTP personnel?
    a. Which of the skills are rated as most important by CTP personnel?
2. Are there any relationships between the top-rated digital-age skills and the characteristics of the participants or settings in the study?

Through research question one, the study aimed to reveal the value that CTP personnel place on technology-related skills among students enrolled in a CTP. Research question two was intended to provide insight into any participant or setting characteristics that have an impact on digital age skills identified as important within a CTP. The goal was to provide suggestions for universities to define technology and computing skills that are

necessary to address in a CTP. The study provided further research related to technology use in comprehensive transition programs and attempted to narrow the gap in the literature on technology related skills addressed within a CTP setting. The study also contributes to the body of research that could lead to the development of resources for CTP programs to assist with the adoption of technology-driven practices within these programs. The results of the study will add to the existing literature on the benefits of technology use for individuals with ID in a postsecondary setting.

Definition of Terms

For the purpose of the study, the following definitions will be used.

Comprehensive transition program (CTP). A postsecondary program for individuals with ID that provides support to these individuals as they prepare for employment. In 2008 the Higher Education Opportunity Act (HEOA) described this type of higher education program. In order to be an approved CTP, a program must meet a specific set of requirements as outlined in the HEOA. A list of approved CTPs is published on the Think College Website as a resource for individuals interested in this type of program (College search, n.d.).; Requirements of comprehensive transition programs, n.d.).

Program personnel. An individual who works within a CTP setting including but not limited to those who serve as program developer, director or coordinator, staff, teacher within the program, peer mentor or graduate assistant.

Technology skills. A term that encompasses a wide variety of skills related to the use of technological devices such as software and hardware and digital communication, such as social networking or a variety of electronic communication methods. This term

refers to skills needed in order to access and utilize the internet, mobile devices, or applications for various purposes, mobile devices, applications (Walsh et al., 2011).

Think College. An organization that provides resources and information for individuals related explicitly to higher education opportunities. Think College advocates for institutional change by promotion and engaging in evidence-based research, student-centered research that supports the inclusion and support of individuals with ID in higher education settings (What is Think College? n.d.).

Conceptual Framework

Practices related to the ISTE standards for students as well as practices that occur in comprehensive transition programs heavily influenced the framework of the study. The goal of the ISTE standards for students is to ensure that individuals use technology authentically in order to learn, grow, and eventually contribute to a technology-enriched society. When used as a guide, these standards should promote a variety of technology-related skills to help students become empowered learners, digital citizens, knowledge constructors, innovative designers, computational thinkers, creative communicators, and global collaborators within K-12 settings and beyond. When students develop these types of skills, they build the ability to function independently and successfully in the technology-enriched 21st Century Society (ISTE, 2016; ISTE standards for students, n.d.; ISTE standards, n.d.).

Comprehensive Transition Programs exist to assist individuals with ID to develop social well-being, job readiness, and independent living ability. With the support of various individuals who work in or support a CTP, individuals with ID participate in direct and indirect learning experiences that contribute to their ability to build these types

of skills that will support their ability to obtain meaningful employment upon the completion of a CTP. The overall goal is to build an individual's ability to function independently in society with the expectation that they will need to be socially active to some extent, have the ability to obtain and maintain a job, and perform various tasks independently in order to be successful (Comprehensive transition programs, n.d.; Folk, 2012).

The ISTE standards promote independence among individuals in 21st-century technology-enriched society, and a CTP promotes independence in society for individuals with ID. When used together, these components can have an impact on the ability of individuals with ID to function independently in the 21st-century, technology-enriched environment that exists in society. With this in mind, Figure 1 is a graphic that represents the conceptual framework of the study. The conceptual framework graphic illustrates the not quite circular but interconnected relationship among the components related to the study and emphasizes the importance of determining the perceptions of CTP personnel related to ISTE standard technology skills. The top level of the framework represents the three key components of the study: the ISTE standards for students, CTP personal perceptions, and Comprehensive Transition Program goals. The ISTE standards are related to CTP Personnel Perceptions in that a CTP program personnel's perception of these standards, has an impact on the work they do with CTPs and the students they serve. Personnel Perceptions are also influenced by the programs they work in and students enrolled. This is why there is a double-sided arrow connecting these two components. On the other hand, program personnel may not typically influence the ISTE

standards in any way so the relationship between these two components is represented with a one-sided arrow.

The second level of the framework includes each component that makes up the ISTE standards for students and the main goals of a CTP program. The third level represents the impact the standards and goals have on students. The final component reflects the impact each of the other components can have on students with ID enrolled in a CTP, illustrating the importance of the study.

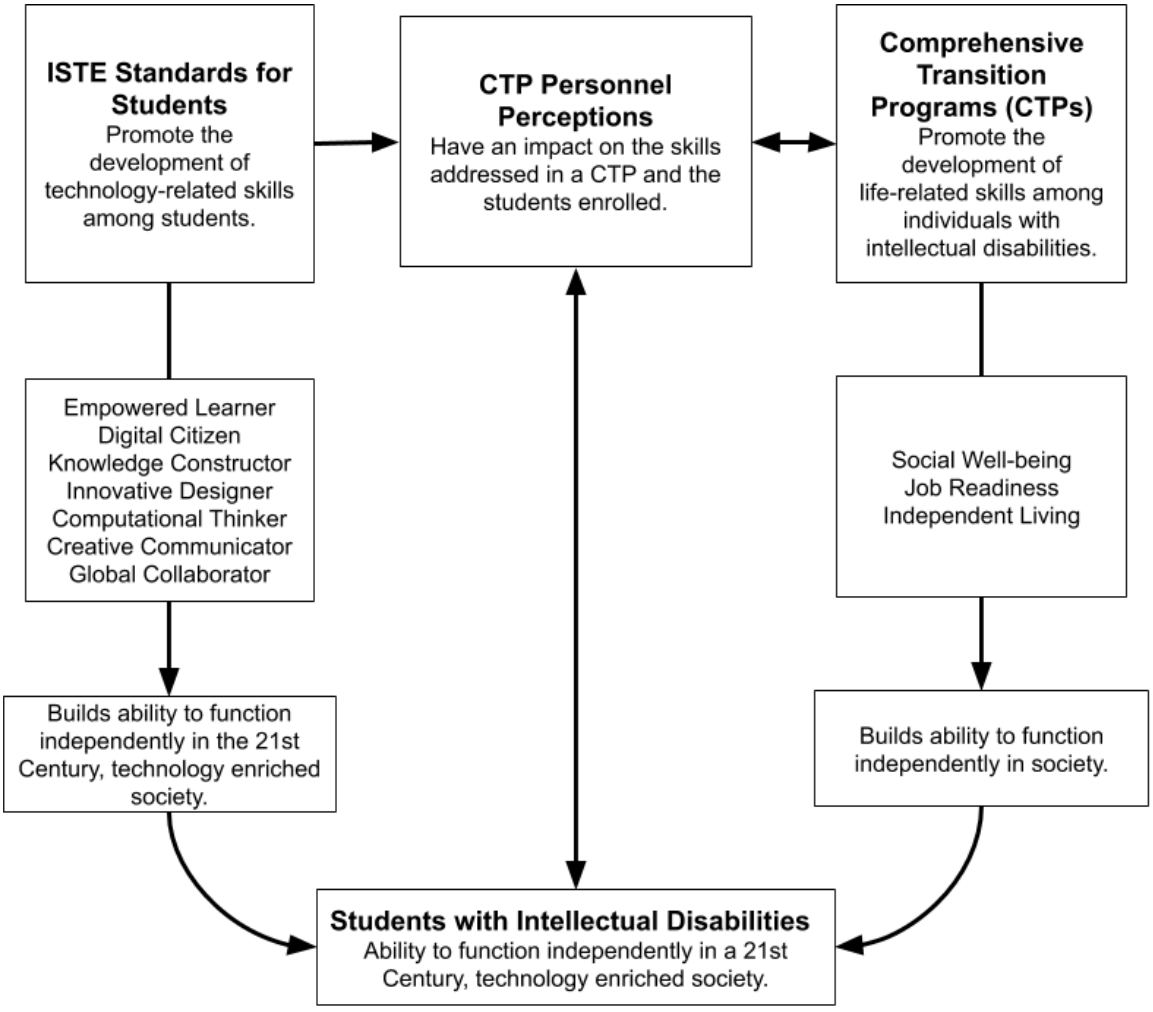

Figure 1. Conceptual framework graphic.

Delimitations

Delimitations, "a systematic bias intentionally introduced into the study design or instrument by the researcher," (Price & Murnan, 2004, p. 66) related to the study included the participants, setting, and time frame. The study was limited to individuals who worked in a CTPs that was listed on the Think College program directory page. Although programs from across the country were included in the study, this did not account for a number of programs across the country that were not listed in the directory. Additionally, because of the anonymous and voluntary participation in the study, it was not possible for the researcher to ensure that all programs were represented in the final data set. Participants were limited to individuals who work in a CTP setting. Voluntary participation in the study led to a delimitation. The response rate to the survey was subject to participant access to the survey, willingness to participate, motivation to participate, and availability of time to participate.

Limitations

There were several limitations related to the research study. First, the electronic survey format made it easy to deliver the survey to participants but made it difficult to encourage and elicit participation. The number of participants led to a limitation of the study. Although individuals from over 250 programs across the country were contacted, not all individuals were willing to share the survey link and encourage colleagues to participate. A total of 103 individuals provided responses, but not all respondents fully completed the survey, leading to a low number of complete responses to be analyzed. Second, the participants' responses relied on their ability to self-report and assumed that participants understood the topics covered in the survey. It also assumed that participants

provided honest responses to the questions. Third, utilizing a survey instrument created by the researcher to answer the research questions also presented a limitation. Since the survey instrument had not yet been tested, there could be concerns about the validity and reliability of the instrument. Fourth, another limitation is that no qualitative data were collected and analyzed to support quantitative data. Without the analysis of qualitative data, it is difficult to determine if the quantitative data truly represent the value participants placed on digital-age skills addressed in the survey.

CHAPTER II

Literature Review

Introduction

In 2016, the International Society for Technology in Education (ISTE) released a set of standards targeting technology use among students. Although designed to universally target students of all levels, these standards have been primarily used to guide technology integration within traditional elementary and high school classrooms. Furthermore, as many students with ID have not been afforded opportunities for postsecondary education, there is limited research that examines the use of the ISTE standards to foster learning opportunities, job-skill development, or independence among individuals with ID through CTPs at the postsecondary level.

The literature review is composed of the following sections: (a) supporting individuals with ID, (b) federal and state support for CTPs, (c) recent research on CTPs, (d) technology for individuals with ID, (e) technology for individuals with ID at the postsecondary level, (d) the ISTE standards for students, and technology skills and CTPs, (e) the ISTE standards for students, and (f) the ISTE standards and CTPs.

Supporting Individuals with ID

For the families of individuals with ID, providing continuous support can be difficult for a variety of reasons. Successful transition to adulthood for individuals with intellectual disability has been measured using specific developmental tasks such as independent living, gainful employment, and maintain friendships and other relationships. Parents of individuals with ID, have other ideas about what genuinely successful transition into adulthood looks like for their children (Henninger & Taylor,

2014). In the past, parents of individuals with ID placed importance on their children's ability to maintain friendships, find meaningful ways to spend free time, and secure locations to live independently with support if needed (Hanley-Maxwell et al., 1995). More recently, for the parents of children diagnosed with an autism spectrum disorder, issues of safety, adult responsibility, and success in education are among some of the greater concerns (Ivey, 2004). For the families of individuals with more severe ID, concerns are focused on job placement and involvement in social activities once their children move on from high school (Kraemer & Blacher, 2001).

Additionally, rather than only focusing on the usual developmental tasks of independent living, successful employment, and sustaining friendships, the families of individuals with ID have a variety of views of the successful transition to adulthood. Family members tend to contemplate a broad collection of goals they have for their loved one as an individual with intellectual disability transitions into adulthood (Henninger & Taylor, 2014). Ultimately, the families of individuals with ID play a vital role in their transition from high school into adult life.

The quality of support provided by families, schools, and other agencies is often a determining factor in the quality of life of an individual with an intellectual disability. Beadle-Brown et al. (2015) found that the quality of support an individual receives is the best indicator of the quality of life for the individual. Individuals with ID living independently often do not receive or seek out quality support due to various barriers that they may experience due to the nature of their disability. Instead, these individuals spend the majority of their time alone with limited contact and interactions with others. If an individual with an intellectual disability does interact with another individual, it is often

someone they already know and with whom they have already interacted. As a result, it is difficult for these individuals to engage in activities that significantly impact and increase their quality of life (Beadle-Brown et al., 2016). Individuals with cognitive disabilities, specifically those with autism spectrum disorder report experiencing academic and non-academic challenges in this setting. These individuals often do not feel comfortable disclosing information about their disability or seeking out and utilizing support available. Students who do not seek out or utilize provided support, often experience overall more negative postsecondary experiences (Anderson et al., 2017).

As individuals with intellectual and developmental disabilities transition from high school into adult life, they often require support from parents, family members, and transition support service providers. Young adults with ID who require more support than their peers without ID are less likely to seek out and participate in postsecondary opportunities. Rossetti et al. (2016) determined that parents with young adult children with intellectual and developmental disabilities had a significant impact on their children's success when they were heavily involved and adamant about seeking opportunities for their children. Unfortunately, parents often face many challenges and obstacles when advocating for and encouraging their children with ID to participate in postsecondary schooling. Rossetti et al. also determined that the burden on parents to advocate for their children would be decreased if schools and other agencies developed more meaningful support for children and young adults with ID.

Federal and State Support for CTPs

In 2008, the Higher Education Opportunity Act (HEOA) (P.L. 110–315) was reauthorized to update the 1965 law. The reauthorization created the first law to address

the term “intellectual disability” and to create an opportunity for individuals with ID to access federal aid to pursue postsecondary education (Grigal et al., 2013). The law called for the improvement of access to postsecondary educational opportunities for individuals with ID and created the need for programs that focus on supporting individuals with ID as they participate in higher education opportunities (Lee, 2009). Before the development of the reauthorization, preliminary results of a Department of Education study revealed that less than one-quarter of students with ID participated in postsecondary education opportunities. At the time of the study, none of these individuals had completed a degree. In 2009, there were only 150 programs focused on providing postsecondary opportunities for individuals with ID and the structure and requirements varied among these programs (Calefati, 2009).

Two years after the reauthorization of the HEOA, the Office of Postsecondary Education (OPE) also supported postsecondary programs for individuals with ID by providing grants to 27 higher education institutions to fund the creation of such programs. In addition to the HEOA, other legislation and policies related to postsecondary education for individuals with ID includes: The Americans with Disabilities Act Amendments (ADAA), Section 504 of the Rehabilitation Act, the Individuals with Disabilities Education Act (IDEA), and other national and state-level vocational rehabilitation policies and practices (Grigal et al., 2013).

Many states followed suit after the reauthorization of the HEOA, by developing their own house bills (HB), senate bills (SB), and other policies that advocated for the development of postsecondary opportunities for individuals with ID. According to a 2018 report by Think College, eleven state legislative bodies had developed, and signed bills

related to postsecondary education for students with ID. Three additional states had published reports to further investigate the current status of or develop higher education opportunities for individuals with ID (Think College, 2018).

California. In California a task force was developed in 2015 to collect data from individuals with ID in postsecondary education programs to conduct an evaluation of the existing programs. This task force also placed emphasis on the collaboration among state education bodies and other organizations and called for more emphasis on ensuring postsecondary students with IDD were prepared for independent living as adults (California Department of Education, 2019) Additionally, a Blue Ribbon Commission of nine individuals appointed by the state's governor was established to develop recommendations for access and affordability as well as to determine the need for additional investment in postsecondary education opportunities (Cal. Legis. Assemb., 2016).

Colorado. The Colorado SB 196: Inclusive Higher Education Act, signed in 2016, led to the creation of pilot programs at three Colorado colleges. These programs were supported through collaboration among several state agencies to provide support and opportunities for individuals with ID interested in postsecondary education opportunities. The bill also required collaboration between the programs and the Colorado Department of Labor and Employment to establish support and opportunities (Colo. Legis. S, 2016).

Delaware. Delaware's HB 326: An Act to amend title 14 of the Delaware Code relating to the Delaware Advance Scholarship Program passed in June of 2018. This bill created a scholarship program to provide grants to individuals with ID who pursue a

degree or comprehensive certificate through a CTP in the state of Delaware. The first set of scholarships were scheduled to be awarded in the 2018 - 2019 academic year (Del. Legis. Hr., 2018).

Florida. The Florida Center for Students with Disabilities was established by Florida Senate Bill 672: Florida Postsecondary Comprehensive Transition Act. The center was created to review reports from existing CTPs in Florida and to work with Think College to determine the need for additional programs in the state. The bill also created a scholarship that could be by students with ID used at Florida public higher education institutions with a CTP (Fla. S., 2016).

Georgia. On March 25, 2015, HR 642: House Study Committee on Postsecondary Education and Employment Options for individuals with Intellectual and Developmental Disabilities was passed. This resolution created a committee tasked with studying the needs of individuals with IDD in regard to postsecondary education in the state. The committee made recommendations that legislature create a council within the Georgia Vocational Rehabilitation Agency focused on the employment of individuals with IDD (Ga. Legis. Assemb. HR., 2015). The Georgia Vocational Rehabilitation Agency helps individuals with disabilities gain independence and meaningful employment in order to become productive members of society (Georgia Vocational Rehabilitation Agency, n.d.-a). In May 2018, Georgia HB 831was signed into law as the Employment First Act. This bill established the Employment First Council that makes recommendations to the state's governor in order to ensure that the state provides inclusive employment opportunities for individuals with IDD (Georgia Vocational Rehabilitation Agency, n.d.-b).

Kentucky. Kentucky HB 158: An act relating to postsecondary financial aid for students with disabilities authorized the increase in scholarships for students who pursue postsecondary education through a CTP in the state of Kentucky. Signed on April 26, 2016, the bill states that students are eligible for a certain amount of financial aid based on the number of credit hours they enroll in for a term (Ky. Legis. Assemb. HR., 2016). According to the director of Kentucky Youth Advocates, an organization focused on advocating for the needs of all children in Kentucky, this bill was Kentucky's first step in ensuring that state law is aligned to the comprehensive federal legislation related to this topic (Kentucky Youth Advocates, 2019).

Maryland. In 2013 legislature in the state of Maryland created a task force and a bill related to postsecondary education for individuals with IDD. The Task Force to Study the Impact of Expanding Credit and Noncredit Courses for Students with Developmental Disabilities was created in July 2013. This task force was responsible for making recommendations based on the study results. Eventually, the task force recommended that Maryland develop two inclusive postsecondary educational programs and invest one million dollars on the development and implementation of these programs. The task force also recommended the state legislature create a scholarship program and individual institutions create their own scholarships for students with IDD. Finally, the task force urged the state to establish guidelines for creating accessible courses for students with IDD and ensuring that at least 50% of the courses students participate in are inclusive (Think College, 2018).

In May 2017, Maryland Senate signed SB 872: James W. Hubbard Inclusive Higher Education Grant Program. This bill created a program to provide institutions with

grants to create inclusive programs for students with IDD. In order to be eligible, institutions must develop a program for students with IDD that involved various aspects of student life including academics, campus engagement, campus living, career development, work experiences, and social development (Md. Legis., 2017).

Massachusetts. On January 21, 2016 Bill H3955: An act relative to strengthening and expanding affordable, quality higher education opportunities for residents of the Commonwealth was enacted to increase the amount of funding for higher education across the state (Mass. Legis., 2016). On July 31, 2016 Bill H4561: An act relative to the inclusive concurrent enrollment grant program was created to provide support for the development of inclusive higher education programs for students with IDD. On June 7, 2018 Bill H4286: An Act creating higher education opportunities for students with ID, autism, and other developmental disabilities was created. This bill expanded the grant opportunities for higher education institutions to build partnerships with school committees in order to provide opportunities for individuals with IDD to participate in higher education. The partnerships supported by the grant were focused on providing opportunities for individuals with IDD to participate in all aspects of campus life, develop employment-related skills, and to complete credit and non-credit courses. Programs that received grant funding were not allowed to charge tuition and were required to provide any support and services needed in order to help students be successful in the program (Mass. Legis., 2018).

Minnesota. Minnesota HB HF2896 required specific Minnesota universities to implement a pilot program for students with IDD. The bill led to two-year pilot programs that had to admit at least ten students with IDD each year. Each program was required to

provide support through mentoring, internships, and the development of independent living skills (Minn. Legis., 2016).

Following the creation of pilot programs, House Bill HF4464 established a one-hundred thousand dollar grant to a specific postsecondary program for students with IDD to support the development of life-skills among students in the program. The bill also stated that the Minnesota Office of Higher Education would provide information to all residents related to postsecondary educational opportunities for individuals with IDD in order to increase knowledge and access to resources for families of students with IDD (Minn. Legis., 2018).

New York. The Act to amend the education law, in relation to establishing a college experience for students with developmental disabilities (A8075) was referred to the New York Committee on Higher Education in January 2018. This bill required the public university systems in the state of New York to develop postsecondary programs for students with developmental disabilities at each institution in the system. The bill required that the programs created focus on a variety of skills including academic, independent living, social, and job-related and provide housing for students enrolled (N.Y. Comm. on Higher Educ., 2017).

North Carolina. The North Carolina Appropriations Act (HB97) authorized the development of fiscal policies to allow for the development of postsecondary education options for individuals with IDD. The act also approved the development of a program and called for the development of indicators to monitor the professional outcomes of students with IDD at community colleges and public universities in the state of North Carolina (N.C. Legis., 2015). Additionally, the North Carolina State Education

Assistance Authority 2016 Report reviewed the state's financial aid resources for students with IDD. Findings of the review indicated that a majority of students relied on federal financial aid, private loans, and vocational rehabilitation assistance to fund their pursuit of postsecondary education opportunities. The report recommended that a grant program and scholarship program expand eligibility to include students enrolled in CTPs (North Carolina Education Assistance Authority, 2016).

Ohio. In the state of Ohio HB 49, the 2018 - 2019 fiscal year operating budget extended the eligibility of the Ohio College Opportunity Grant to individuals with ID enrolled in a CTP (Ohio. Legis., 2017-a) Additionally, SB 5 was passed to address college affordability. In addition to a number of items related to increasing college affordability, the bill specifically allows for an increase in income tax deduction for disability expense account contributions or tax-advantaged savings plans (Ohio. Legis., 2017-b).

Oklahoma. Oklahoma HR 1065 is a resolution that supported the development of postsecondary programs for students with IDD. The bill charges higher education institutions in Oklahoma with creating these programs in partnership with all related government agencies and private sector businesses that can lead to learning opportunities for students with IDD. Oklahoma higher education institutions were also tasked with collecting and analyzing student outcome data with the assistance of national disability groups (Okla. Legis., 2016).

Rhode Island. Rhode Island SB2476 created a Governor's task force focused on increasing career opportunities for individuals with IDD. The board was required to develop a statewide employment and training plan related to this initiative and to use the

State Career Pathways System to expand employment opportunities for individuals with IDD. (R.I. Legis., 2016).

Tennessee. In May 2016 HB 1983 was signed to update the specifications of the STEP UP scholarship. This scholarship was awarded to individuals with IDD who enrolled in a postsecondary program at any of the five specified universities in the state of Tennessee. Originally, the scholarship could only be applied to a two-year postsecondary program. HB1983 updated the scholarship requirements to allow funding to be applied toward a four-year program (Tenn. Legis., 2016).

Texas. The 2015 Texas HB 1807: Inventory of Postsecondary Education Programs for Persons with Intellectual and Developmental Disabilities requires that the Texas Higher Education Coordinator Board publish and maintain updated information about postsecondary programs and services for students with ID or developmental disabilities (Tex. Legis., 2015). In 2016, a survey focused on recruiting individuals with IDD at public higher education institutions was deployed. SB 37 includes a report of the results of the survey. Results indicated that institutions did not have enough resources and staff focused on recruiting individuals with IDD. The report also states that individuals with IDD who did enroll in higher education programs in the state, struggled with the transition from high school to college, were unprepared, and dealt with travel-related obstacles (Tex. Legis., 2016). More recently, the 2019 HB 3165 signed to approve the Occupational and Life Skills Associate Degree Program to be through the Lone Star College Systems (Tex. Legis., 2019)

Washington. SB 5946 was signed in March 2016 to create a commission made up of education advocates, researchers, educators, parents, students, and mental health

professionals. The goal of the commission was to develop a plan for the improvement of the education of individuals with disabilities at all levels (Wash. Legis., 2016). In January 2018, the Washington Commission on Persons with Disabilities was created with the approval of HB 5949. The commission is responsible for advocating for the involvement of individuals with disabilities in community, school, and workplace events. The commission is also responsible for developing a statewide plan focused on the needs of individuals with disabilities. Starting in 2019, an advisory council consisting of seven members with disabilities and five additional members will meet to make recommendations related to policy and assessing disability needs in the state (Wash. Legis., 2018).

The rising support for the development of postsecondary programs and support services for individuals with ID, led to an increase in the number of federal and state recognized programs. The number of individuals with ID participating in higher education opportunities across the country steadily increased (Hart et al., 2010). In 2019, just ten years after the HEOA reauthorization, there are over 260 programs that are considered CTPs and are listed by Think College as such. This number does not include any programs that provide services to individuals with ID at the postsecondary level but are not listed on the Think College site due to several factors (Think College, n.d.-a). With support at the federal and state level, the number of programs and opportunities in postsecondary education for individuals with ID continues to increase.

Recent Research on CTPs

In addition to federal and state laws that recognize the importance of postsecondary educational opportunities for individuals with ID, several research studies have recently been published to examine the impact of these opportunities. Harrison et al. (2019) studied the impact

of an inclusive postsecondary program for individuals with ID on the attitudes of typically matriculating students. The researchers used the Attitudes Toward Intellectual Disability Questionnaire to measure attitudes of student volunteers working in the inclusive program and of students who had no connection to the program. Findings of the study indicated that when compared to the group of students who had no connection to the program, the student volunteers who worked within the inclusive program with individuals with ID had lower discomfort, higher knowledge of causes, and higher preference for interaction with individuals with ID in general. Overall, the attitudes of the typically matriculating student volunteers toward ID were positively impacted.

In another study, researchers attempted to better understand the college experience of students with ID. Participants in the study included students with ID, students with mild learning disabilities, and students without disabilities. The researchers collected data related to perceptions, attitudes, and activities of each group of participants. They determined that similarities existed in the college experience for each group of participants and that each group was influenced by family and teachers to pursue postsecondary education. The findings of this study provide further insight into the academic, social, and personal challenges individuals with IDD face when participating in postsecondary education and also highlighted the benefits of additional support for students with ID in postsecondary programs (Plotner & May, 2019).

Prohn et al. (2019) examined the perceptions of peer-support students on the social experiences of college students with ID. The researchers formed three peer-support focus groups comprised of students without disabilities who could provide insight into the observed social experiences of individuals with ID in a college setting. The groups identified that the elements of campus environment, support, individual skills for developing and maintaining social relationships, and social self-determination to be large influences on an individual with ID's social inclusion or exclusion. As a result, the researchers recommend that postsecondary

programs for individuals with ID ensure that students receive support to reduce social barriers and achieve social inclusion in a college setting.

Ryan et al. (2019) conducted a study focused on employment and independent living outcomes of individuals with ID in a postsecondary program. In this study, the researchers collected survey data from the parents of graduates of a particular program. The researchers determined that 100% of the students had at least one paid employment position or enrolled in additional postsecondary training. They also determined that 44% were living independently. The findings of the study indicate that the graduates from the program had higher rates of employment and independent living when compared to the national averages for individuals with ID in regard to these topics.

In addition to recent published research related to postsecondary programs for individuals with ID, two dissertation studies on this topic have been completed. Carey (2019) completed a study focused on the effects of mentoring on individuals who mentor postsecondary students with ID. Individuals who participated in the study included student peers, program staff, and faculty. These participants completed self-reflections and participated in interviews and focus groups. Findings of the study suggested that the attitudes and beliefs of participants were positively impacted by their mentoring of students in the program.

Vroman (2019) completed a phenomenological study on the experiences of individuals with IDD in college programs as told by the individuals participating in the study. Participants were asked to use photographs and spoken word to describe their experiences as a college student with an IDD. Findings of the study call attention to the complicated issues surrounding postsecondary program facilitation of the development of social and academic skills through participation in campus life, the development of friendships among students with and without disabilities, and support staff involvement in students' lives. Findings call attention to the need to more closely examine student experiences as we strive to meet the needs of a grouping population of individuals with ID who participate in postsecondary education opportunities (Vroman, 2019).

Continuously increasing the support for the development of programs and services for individuals with ID is made clear through the research. Due to the number of policies and legislative activities, it is obvious that federal and state legislature also support these programs. As a result, it becomes more well-known that individuals with ID can participate in the college experience after high school graduation just as many of their peers do.

Technology for Individuals with ID

Through the use of technology, an individual with an intellectual disability can connect to a resource that serves as a subject-matter expert. This subject matter expert can provide just-in-time support as these individuals attempt to learn to navigate their lives in a higher education setting as they build skills related to academics, independence, future job placements, and other aspects of daily life. Now that technology has become integrated into daily living, software and devices can help educators to keep the attention of and better support students through the learning process. Technology can also strengthen the communication between a student and teacher to facilitate the development and growth of social life (Goksu et al., 2016). Individuals with ID can utilize mobile devices for self-instruction, video tutorials, or additional supports as needed when completing academic, social, or daily living tasks. By using technology, these individuals who must often rely on the support of adults or caregivers, are able to increase their independence by relying on a mobile device instead of another individual (Smith et al., 2016). As a result, an individual with ID, can appear to function as many of their peers without ID.

Golisz et al. (2018) presented findings of a study conducted in 2017. Participants in the study included three individuals with mild to moderate ID. Quantitative data allowed the researchers to determine that the use of technology applications and devices

supported these individuals to complete selected tasks. Findings of the study imply that everyday technology can be utilized to provide individuals with ID support and guidance as they complete tasks in order to assist in the development of daily living skills.

In 2018, Çattık and Ergenekon evaluated the effectiveness of video modeling and auditory technology on their ability to assist individuals with ID in retaining skills related to obtaining community resources as needed. Results of the study indicated that after several weeks of the intervention, the participants acquired and maintained the desired skills. Generally, the participants had reported positive feedback about participating in the study. Two of the three participants reported that they continued to utilize the skills they gained during the study. Parents of the participants also reported positive feedback about the study. They were aware of the value and impact of video modeling on their children's ability to obtain and retain the skills they learned. The staff employed in the settings where the participants were asked to practice their new learned skills acknowledged the importance of teaching the skills to individuals with ID. Due to the small number of participants, it is unclear if these results could be replicated with a variety of individuals with ID. The study also included other limitations, such as the inability to control several external variables in the natural settings, the times the study sessions were conducted, and the limited activities studied by the researchers. Overall, the study supported the idea that technology can be used to help individuals with ID. In order to determine the depth of impact technology can have in this setting and on the variables studied, more research is required (Çattık & Ergenekon, 2018).

For individuals with ID, technology can remove barriers related to access to information, communication, and interaction with others. Now that information and

communication technology is accessible through more mobile devices, individuals with ID can readily access these technologies in order to remove disadvantages related to education, employment, government services, financial services, disaster relief services, and more (Raja, 2016).

There is a plethora of research focusing on using mobile touch-screen devices to assist individuals with ID. Much of this research focuses on the use of these devices for leisure activities or for providing prompts in the form of video, pictures, or audio. Additionally, a majority of studies focus on individuals with ID in pre-kindergarten through twelfth-grade settings. There is little research on using mobile devices to assist individuals with disabilities using apps specifically designed to help them complete a variety of academic, social, or daily living tasks. There are also a limited number of studies in higher education settings that focus on the technology used in postsecondary programs designed for individuals with intellectual and developmental disabilities.

Mobile devices with universally-designed prompting systems can be used to improve the performance of individuals with ID in school and work settings. When using mobile devices, most individuals with ID make significant progress in independent completion of tasks. Stephenson and Limbrick (2015) conducted a review of several studies that focused on mobile device apps used with individuals with ID. The researchers narrowed their study down to a total of 36 papers and discovered that the most popular device studied was the iPod touch. Many studies produced results showing the effectiveness of mobile touch-screen devices, but the studies reviewed covered only a small number of the apps available. The researchers concluded that the most successful or high-quality studies approached from a behavioral perspective rather than a case-study

design. High-quality studies also utilized clear criteria for successful application use instead of a wide range of uses (Stephenson & Limbrick, 2015).

Several studies show that using an interface that allows the individual to select the desired level of support when completing a task, supports and encourages an individual with ID to become less reliant on prompts as they work toward completing or replicating a task (Meechling et al., 2010; Meechling & Seid, 2011; Mechling et al., 2009; Van Laarhoven et al., 2018).

Technology for Individuals with ID at the Postsecondary Level

Technology can provide a bridge to success for a postsecondary student with ID by providing support as they develop the necessary social and independent living skills to ensure their success upon graduation from a postsecondary program. The specific needs of an individual with ID vary depending on the individual's level of disability and the presence of other potential limitations such as physical disability or insufficient to access mobile devices and other technology (Wehmeyer et al., 2012). Computer-based interventions (CBI) can be used to advance the daily living skills and academic achievement of individuals with ID. In 2011, researchers discovered that some programs designed for this purpose were no longer available to be utilized, however; there are computer programs designed with alternative intentions that could be modified to work for individuals with ID to utilize. Unfortunately, if programs or tools are not specifically designed to be used to assist individuals with ID, a teacher, parent, or other learning facilitators are needed to adapt the program to fit the needs of the individual with ID. As a result, the knowledge of the teacher, parent, or learning facilitator and their ability to

train individuals with ID to use the technology impacts the success of a program (Ramdoss et al., 2012).

In order to successfully utilize technology to support the development of academic, social, and independent living skills among individuals with ID, those that care for and work with these individuals must be able to assist with the use of technology in this setting. Haymes et al., (2013) suggest that there is a great need for gathering the input of individuals who provide support to individuals with ID regarding the development of technology and technology training. Furthermore, without assessing the daily use of technology by individuals with ID, it is difficult to determine if current technology use is sufficient in supporting the needs of these individuals. Stephenson and Limbrick (2015) discuss the need for additional research about the differences among more traditional intervention and instructional methods and those that utilize mobile-touch devices in order to discover the effectiveness of mobile devices in this setting.

New technologies have the potential to save time, increase efficiency, decrease errors, and enable more meaningful assessments of the development of individuals with ID. If there are perceived risks involved in the use of new technology, support staff worried that embracing new technology would be difficult or time-consuming to learn. Additionally, members of the support staff were aware that the concerns of privacy and safety of the users, lack of proper training, or high cost of technology, could bring about challenges to the integration of new technologies within their work setting (Clifford, et al. 2018). To provide individualized support to the students they serve, postsecondary programs designed for individuals with ID require additional information related to the implementation of technology (Haymes et al., 2015). Once additional research about the

necessary skills, resources, and support is available, information and resources for individuals who work in a comprehensive transition setting can be provided.

Maich et al., (2018) conducted a study to determine the effect of technology on the learning and independence development of individuals with ID in a community college program. Participants in the study included students with ID as well as their learning facilitators who were asked to complete a survey and participate in focus groups to collect quantitative and qualitative data. The focus group interviews revealed that students expressed value for the technology and acknowledged that it led to an increase in their efficiency, effectiveness, and productivity related to homework and academic activities. During the study, student participants also realized that the technology skills learned could be used in other aspects of their lives to increase their independence. The learning facilitators agreed that the technology led to a higher level of independence among the students, and with encouragement and motivation, the students could continue to use technology to achieve independence and accomplish other goals. One learning facilitator expressed that if the technology could be implemented from the beginning of a program, the need for support may decrease as students with ID progress through a program. (Maich et al., 2018). Although this study showed that there is an excellent potential for the use of technology, there is a need for additional research to thoroughly grasp the full potential of technology to help individuals with ID in postsecondary settings.

White et al. (2016) conducted a study comparing the impact of a technology-based intervention program on the impact of a non-technology-based intervention. Both intervention methods were designed for and used by individuals with autism attending

college. Participants used a mobile device or desktop computer to complete a series of activities for the technology-based intervention. The non-technology-based intervention included a variety of group and individual activities. Findings of the study revealed that there was no significant difference between the two intervention types. Despite the inconclusive results, researchers recommended that additional research be conducted related to the impact of technology-enhanced interventions due to the feasibility and social validity for this group of individuals (White et al., 2016). The findings of this study further support the need for research and support within a CTP that ensures students with ID can maximize learning through the use of technology.

Technology Skills and Comprehensive Postsecondary Transition Programs

Mastery of technology skills is needed for individuals with ID to take advantage of the technology available to support their success. According to Kellems et al. (2015) for individuals with intellectual and developmental disabilities, technology is invaluable in providing access, support, and assistance when working on the development of job-related, academic, or functional life skills. Technology enables a postsecondary transition program to expose students with various disabilities to a variety of college and career activities that they may not encounter in a traditional classroom environment. In order to make a real impact on postsecondary experiences of individuals with disabilities, postsecondary transition program providers should take advantage of the continuous advancements provided by technology in order to ensure that students are successful in job placements, academic settings, and their everyday lives (Kellems et al., 2015).

As the demand for students in preschool, primary, secondary, and higher education settings as well as individuals in work-related settings to utilize digital-age

skills increases, individuals with intellectual and developmental disabilities should be able to develop and refine digital literacy skills. While developing these skills, students with ID must be taught to operate and utilize devices that help them to learn new skills and increase self-determination and independence (Kelley et al., 2016). The increasing availability of advanced technology created to assist individuals with intellectual and developmental disabilities allows comprehensive transition program providers to match the most appropriate supports with students' needs. Ayres et al., (2013) argue that the following factors are required in order to implement technology in an educational program successfully: awareness of available technology, understanding of how it can assist with instruction, knowledge of ways it can support day-to-day activities, and the ability to teach students as well as educators to use the technology (Ayres et al., 2013). If a comprehensive transition program does not measure the current status of the ability of its stakeholders to utilize technology, a program may not be able to meet the factors suggested. With no previous studies conducted about the implementation of the ISTE standards for students, it may be challenging to provide support to CTP programs in need of assistance with developing the technology-related skills of the students they serve. Providing resources to these programs will ensure that students will be able to successfully utilize the technology they will encounter during their time as a student, in future job placements, or life in the community.

ISTE Standards for Students

Providing individuals with access to the appropriate technology can foster interactive learning experiences that build knowledge and a passion for further learning simultaneously (Vitale, 2018). The goal of technology in education is not only to ensure

that students learn specific technology, but also that they can use technology to accomplish learning outcomes. The type of technology used is not as important as preparing students for the 21st-century society in which they will learn, live, and work (Curry & Curry, 2018). This same concept can and should be applied with individuals who have ID, especially those in a transition program working toward obtaining meaningful employment.

Throughout the past several decades, the number of organizations focused on educational technology have developed as the interest in the topic has systematically increased. Of the organizations, the International Society for Technology in Education (ISTE) has become the most prominent. Since its inception in 1979, this organization worked toward establishing a set of standards that encouraged the use of educational technology to improve the learning outcomes of students. The organization's first set of standards, National Educational Technology Standards (NETS) served as a guide for teachers, administrators, and students (Ayad, 2017; Kurt et al., 2008). In the years since the NETS standards were released, ISTE has continuously worked to make improvements as technology changes and research is conducted. ISTE standards have been and continue to be utilized by a variety of individuals who have an influence or stake in the learning process within any given educational setting. As a result, ISTE has published multiple sets of standards that focus on each group of stakeholders as follows: ISTE standards for students, ISTE standards for educators, ISTE standards for education leaders, ISTE standards for coaches, and ISTE standards for computer science educators. Additionally, ISTE also offers computational thinking competencies that are designed to assist with

developing computational thinking (CT) among students of all ages across all disciplines (ISTE standards, n.d.).

The current version of the ISTE standards for students in was published 2016. To ensure that learners are at the forefront of the learning process, ISTE board members, members, and other stakeholders worked to develop the new robust set of standards that addressed various uses of technology. According to Trust (2018),

> In 2008, the International Society for Technology in Education (ISTE) published a set of forward-thinking standards for teachers that focused on using technology to support student learning and creative thinking, design digital age activities and assessments, model digital work, promote and model digital citizenship, and engage in professional growth and leadership. (p. 1)

This set of standards asks teachers to provide more authentic learning experiences for students in order to prepare them for the future. In order to accommodate new technology software, hardware, and skills students will need as they join the 21st-century workforce, the standards were updated to place more emphasis on using technology to empower students rather than focus on only teaching with technology (Smith, 2017). The ISTE standards are aligned with research that focuses on the idea of using the power of technology to transform the learning process in order to ensure that individuals can see past technology as tools and have the vision to see technology as a gateway to learning (Curry & Curry, 2018). The ISTE standards for students consist of seven standards as follows: empowered learner, digital citizen, knowledge constructor, innovative designer, computational thinker, creative communicator, global collaborator. Each standard has four sub-standards that address and explain different aspects of the standard using

student-centered language (ISTE standards for students, n.d.) (see Appendix A for a full list of ISTE standards for students). Each of these standards and sub-standards addresses technology-enhanced learning and teaching approaches that are supported by research (ISTE, 2016).

Empowered Learner. A significant theme that emerged during the most recent ISTE standard refresh was the idea of empowering and encouraging students to have ownership in their learning (ISTE, 2016). Reports from several individuals who work in related fields and current research support the idea of students as empowered learners. Conley (2015) suggested that one of the key factors that influence college readiness is critical learning skills and technologies. This factor involves students feeling ownership of their own learning, which can be fostered by connecting skills such as, technology capabilities a variety of student dispositional skills. In an executive summary from 2014, Enyedy called attention to the need to examine the current role of technology in the classroom. He called on policymakers to work with stakeholders in order to make decisions about technology use that would benefit student learning rather than superficially promoting computerized instruction or ineffective technology for the sake of using technology. Enyedy's call to action inspired ISTE to examine the standards for students in order to promote a rise in the facilitation of technology use throughout all parts of the learning process by both students and teachers (Enyedy, 2014). Similarly, Ferguson et al., (2015), Freeland (2014), Gerstein (2016), McCombs (n.d.), and Tullis and Benjamin (n.d.) discuss the importance of ensuring that students develop as empowered learners to ensure their success in the 21st-century workforce. This development can be facilitated through the use of technology to encourage students to

take ownership of the learning process. This research supports the idea that the success of students in the future workplace students become empowered learners by having ownership of the learning process through the use of technology is vital to their success in the 21st-century workforce.

In addition to individuals who have published reports in support of ensuring that students are empowered learners, current research also supports this concept. Drexler (2010) emphasized the importance of students as empowered learners through the use of new technology that provides flexibility within an educational setting. She offers a foundation for teachers to provide students with opportunities to take control of their learning process. Findings of her research suggest that supporting students throughout the process of developing personal learning environments, can develop learning processes in which they take responsibility that will follow them beyond the classroom (Drexler, 2010). Empowering students by letting them lead the learning process instills a desire to learn that will follow a student throughout their educational journey in order to help them become more self-aware and have a desire to learn that will go beyond the end of their kindergarten - twelfth grade (K - 12) schooling (Fanning, 2018).

Digital Citizen. Now that it has been well established that individuals of all ages utilize the internet through the use of a variety of tools and devices, it is essential that they understand how to access and conduct themselves in a safe, legal, and ethical manner in an online format. In today's society, people across the globe use technology for many aspects of their daily lives. As a result, a digital society has emerged that provides individuals with opportunities to obtain an education, seek and secure employment, enjoy entertainment, and communicate and collaborate with others on a global level. As part of

this digital society, individuals should be held accountable for following a set of rules and guidelines as they would in any society (Ribble, 2015). Today's generation of K - 12 aged students, likely struggle to remember what life was like before many of the devices, social media platforms, and other digital tools. Teenagers ages 13 to 17 report that they go online daily and acknowledge that they regularly use the internet, and many teens report accessing online content several times a day (Lenhart, 2015). Many researchers have sought to answer questions related to students using technology appropriately and their understanding of the responsibility they share in ensuring that they are a responsible digital citizen (Ribble, 2015). The need for students to be able to critically evaluate the validity, reliability, and appropriateness of online content is more important than ever. Educators have a responsibility in ensuring that students understand the potential impact of technology on human rights, are exposed to a variety of perspectives and viewpoints and see the need for contributing to a continuous dialogue related to privacy rights (ISTE, 2016). By focusing on this aspect throughout the education of a student at any level, educators support their development into responsible digital citizens who can positively and productively contribute to the current society so heavily influenced by technology.

Knowledge Constructor. The ISTE standard referring to students as knowledge constructors refers to their ability to curate resources utilizing digital tools. With the extensive collection of information available for access through the internet, students can now acquire resources related to their learning progress and interests. The meaning of literacy changes as the need arises for students to be familiar with the terms and concepts related to technology as a result of the development of new technology related to information and communication. Comprehension of reading online information is not

synonymous with traditional offline reading comprehension. As a result, there is a need for students to understand and construct knowledge about the necessary skills and strategies that are unique to comprehending online information (Leu et al., 2011). When taught correctly, the concept of curation can serve as a tool to enhance digital and media literacy among students (Cohen et al., 2013). Learning to become knowledge constructors through the use of digital curation allows students to strengthen their ability to synthesize information from multiple sources in order to develop their understanding of a concept.

Innovative Designer. Blikstein (2013) emphasized the value of exposing students to 'making' in educational settings stating that,

> . . . the real power of any technology is not the technique itself or in the allure it generates, but in the new ways of personal expression it enables, the new forms of human interaction it facilitates, and the powerful ideas it makes accessible to children. (p. 219)

The ISTE innovative designer standard is grounded in the idea of allowing individuals to explore how things work in a hands-on manner such as 3D modeling or creating prototypes and developing processes, also known as 'making.' This standard also calls for the incorporation of project-based learning and problem-solving that encourage students to build social and emotional skills in order to promote critical thinking. Encouraging students to become innovative designers asks them to work through problems and real-life situations that they may encounter in the world in which they will live and work. Promoting innovative design skills among students also allows them to build creativity, expression, and a desire to be engaged in solving real-world problems (ISTE, 2016). The Maker Movement began with a group of individuals

considered hobbyists, tinkerers, engineers, hackers, and artists. They were considered to be part of the Maker Movement due to the nature of the work they did that was considered both playful and useful to their work environment or life. This movement has gained popularity in K-12 education because it allows students to engage in engineering and STEM-related activities that deepen their understanding of a variety of concepts. The Huffington Post published an article in 2013 focused on the ability of design thinking, or making, to create meaningful, real-life learning experiences. Through the use of design thinking models, teachers can become facilitators of learning while guiding students through active learning. Design thinking allows for the more profound development of skills at a faster rate (Gray, 2013). Making and designing in education have the potential to transform the learning process to change what we consider learning, a learner, and a learning environment. The impact of this concept has the potential to change system-wide practices in order to create more equity in the field of education (Halverson & Sheridan, 2014).

Computational Thinker. In the current technology-driven society, an individual's ability to think and problem solve like that of a computer is vital. Computational thinking (CT) involves the breakdown of problems into smaller pieces that allow for analysis to determine solutions. According to ISTE (2016),

> Some of the fundamentals of CT include breaking problems down into smaller parts in order to analyze their solutions (problem decomposition); recognizing patterns and making connections; automating solutions through a series of ordered steps (aka, using algorithms); using abstractions to represent data, such as models or simulations; organizing and analyzing data logically; and

generalizing problem-solving process in order to transfer them to other problems. (p. 6)

The development of computational thinking skills also guides students to organically develop social and emotional skills as well as persistence and tolerance when working through ambiguous, complex, or open-ended problems individually or collaboratively with others. CT skills are not exclusive to software engineers because as students grow in a technology-enriched world, they will encounter computational vocabulary and processes throughout their lives. CT abilities ensure that an individual can communicate and collaborate with peers despite technical issues that may occur. This skill also develops an individual's knowledge about how computing works and how it impacts various aspects of their lives (ISTE, 2016).

Shute et al. (2017) discuss the idea that more emphasis on CT in educational settings can provide the foundation for assessments of CT skills that will lead to a deeper understanding of a student's knowledge and abilities. They also highlight the overlap that exists among computational thinking and mathematical thinking. Illustrating that problem-solving, modeling, data analysis, and interpretation, and statistics and probability skills develop through the use of both mathematical and computational thinking (Shute et al., 2017).

Additionally, the introduction of the Next Generation Science Standards includes computational thinking as an essential scientific practice. The overlap between scientific thinking, mathematical thinking, and computational thinking cannot be ignored as we move toward educational practices that prepare students for the 21st-century workforce

(Weintrop et al., 2016). The importance of incorporating the development of computational thinking skills among students of all ages cannot be ignored.

Creative Communicator. This ISTE standard asks students to build their ability to communicate effectively and with creative expression. The standard calls for students to be able to select, create, remix, and publish information depending on the type of information addressed. A student must use knowledge about a variety of tools and ability to evaluate and choose a tool for the given task to achieve successful creative communicator status. They must also be able to use a variety of tools to creatively express themselves and incorporate various types of media in their work (Smith & Mader, 2017). The application of meaningful complex thinking in various contexts requires the mastery of communication techniques via a variety of mediums. Additionally, the most effective leaders have a high level of communication skills that allow them to communicate with others to achieve goals and use data to support their ideas (Adams Becker et al., 2016). With this in mind, educators must strive to build students to become creative communicators so that when they join the workforce, they become effective leaders who positively contribute to society.

Global Collaborator. According to the United Nations' Global Education Initiative, education, "must give people the understanding, skills, and values they need to cooperate in resolving the interconnected challenges of the 21st Century" (United Nations [UN], n.d.). The Global Collaborator standard addresses the need for students to become global citizens by participating in experiences that allow them to connect and collaborate with others on a worldwide scale. With the power of current technology, students can interact with and learn from citizens who live in different cities, states, and

countries. Global collaboration helps students to develop the ability to view things from a different perspective or empathize with others who have different ideas and experiences (ISTE, 2016). Through the use of technology, students can participate in global learning opportunities that supply knowledge about global events that impact the world and their local area. Participation in such experiences strengthens a student's awareness of global events and the ability to solve problems from a global perspective (Truong-White & McLean, 2015).

Global collaboration has the power to facilitation the development of communication, collaboration, critical thinking, and problem-solving among students. In order to collaborate on a global scale, students must possess the ability to adapt to different situations, communicate effectively, solve problems creatively, utilize technology, and empathize with cultures other than their own. Global collaboration can move students from simply using technology tools to building the technology literacy that will guide them to become effective decision makers when it comes to problem-solving using technology (Cook et al., 2016). In conclusion, fostering global collaboration skills among students is essential in ensuring that they successfully develop the technology skills needed in order to be successful in a technology-enhanced society.

ISTE Standards and Comprehensive Transition Programs

The concepts addressed by the ISTE standards can be related to the skills addressed within adult transition programs in postsecondary settings. Developing the skills related to each of the ISTE standards (Empowered Learner, Digital Citizen, Knowledge Constructor, Innovative Designer, Computational Thinker, Creative Communicator, and Global Collaborator) among the individuals in a CTP will contribute

to their success related to academics, social skills, job related skills, and independent living skills within a program and in the future. Kivunja (2015) describes the current 21st Century Digital Economy in which education providers must ensure that students develop the digital age skills necessary for success in the current digital age. A student equipped with digital age skills is more likely to be better educated, a better citizen who positively contributes to society, and better prepared to meet the needs of a variety of work environments. Universities who provide students with opportunities to develop and strengthen digital age skills will have a higher percentage of students who are successful in the workforce and in other aspects of life (Oraison et al., 2019).

To conclude, addressing technology-related skills within a CTP is vital to ensure the success of students with ID as they are expected to become an independent and productive member of the current technology enriched society. As previously mentioned, the ISTE standards can be used as a guide to program design that addresses the development of digital age skills, however, it is important to understand the degree to which each component of the ISTE standards will be beneficial for students enrolled in a CTP. It is important to learn which standards are selected as important by individuals who work within a CTP in order to inform program design or the development of resources related to technology use and digital age skills that are specific to CTPs.

According to Hart et al., 2010, “When opportunities are provided that are inclusive and take advantage of the naturally occurring learning environments that are a part of every college campus, PSE [post-secondary education] offers the greatest possibility for maximizing growth and life enhancement,” (p. 145). The naturally occurring learning environments that exist in postsecondary education of the digital-age

include technology that is used to share course documents and information, to complete assignments, communicate with peers, professors, and others, and to access support services. To take full advantage of these digital age naturally occurring learning environments, there is a need for CTPs to ensure that students can use the technology available to reap all the benefits a postsecondary experience has to offer.

Summary

Chapter 2 provided an overview of the current literature related to the study. The chapter began by discussing the current practices for providing support to individuals with intellectual and developmental disabilities. Next, the chapter covered background information about CTPs and the growth of these types of programs as a result of federal and state support in the form of legislation and committees. Next, more recent research related to CTPs is addressed and discussed. The chapter also discussed the use of technology to support individuals with ID in general and at the postsecondary level. Finally, the chapter covered the purpose and importance of the ISTE standards for students and concluded with a discussion of the need to address digital age skills with individuals in CTP programs. The literature discussed in this chapter makes the case for the study that was conducted.

CHAPTER III

Methodology

Introduction

As discussed in Chapter 1, the purpose of the study was to determine the perceptions of program personnel on necessary technology skills in comprehensive transition programs. Using the 2016 ISTE standards as a guide, the study investigated program personnel perceptions on the importance of the following ISTE standards for students: (1) empowered learner, (2) digital citizen, (3) knowledge constructor, (4) innovative designer, (5) computational thinker, (6) creative communicator, and (7) global collaborator. This chapter describes the methodological design of the study conducted to add to the limited body of research on this topic. The process for development, field test, and deployment of the survey instrument is addressed.

Research Questions

The study addressed the research questions: (1) How are ISTE standard related digital skills rated by CTP personnel? (1a) Which of the skills are rated as most important by CTP personnel? (2) Are there any relationships between the top-rated digital age skills and the characteristics of the participants or settings in the study?

All data were collected using a survey instrument guided by the ISTE standards for students that address digital-age skills. The instrument measured the perceptions of CTP personnel by asking participants to rate the importance of each digital-age skill in relation to a CTP setting. The same instrument was used to collect anonymous demographic and program-related information. Prior to sending the survey to the

programs listed in the Think College Directory, a field test of the instrument was conducted with similar programs.

Research Methods

The researcher utilized a survey design to collect quantitative data in order to answer the research questions. This was achieved through the use of a Likert-scale survey created by the researcher based on the ISTE standards for students. The ISTE standards for students, created by the ISTE organization, are a framework for the development of technology-related skills. The researcher created the survey instrument to include twenty-eight questions directly related to the sub-standards that make up each of the ISTE standards (see Appendix C). The second part of the survey consisted of 13 selected-response or open-ended questions related to the participants or program's background (see Appendix D). Questions were organized so that participants could view and answer all of the Likert-scale questions at one time and then move on to view and answer all of the demographics related questions at one time.

Due to the nature of the study, the quantitative data collection method selected was the best option for the first study taking a closer look at this particular topic. With consideration for the participants and setting in which they work, observations and personal interviews may not have allowed for the honesty and the desired number of participants that an anonymous survey allowed. Additionally, conducting interviews, observations, focus groups, or other qualitative data collection methods, could create the potential for biased survey administration and data collection. Qualitative data would not allow for the concrete data required for statistical analysis which can be used to support the need for additional research related to this topic. Furthermore, mixed-methods data

collection may result in one data collection method being weaker than the other due to a variety of factors within and outside of the researcher's control.

Instrumentation

The researcher used a survey instrument to collect quantitative data related to participant perceptions of digital-age skills within a CTP setting. Surveys are a useful tool that can be used by researchers to collect quantitative data for a research study in a manner that is easy for the researcher and participants. A well-developed research question and problem statement which enables the researcher to select the appropriate data to collect produce a quality survey instrument. Effective surveys do not require participants to complete questions that produce information that is not relevant to the study or will not provide meaningful data (Leggett, 2017). In the past, web surveys have presented concerns for researchers due to low response rates in many cases. According to the literature, there are many factors throughout each stage of the web survey process that can affect the response rates to web surveys. Among the factors that can influence survey response rates are survey design, participant demographics, privacy and confidentiality, sampling and subject solicitation (Andrews et al., 2017; Fan & Yan, 2010).

Due to a lack of the existence of created and tested instruments in current research, the researcher opted to create an instrument to be used for the study. The survey instrument was developed by formatting the current ISTE standards for students into questions about the importance of each substandard in relation to students enrolled in a CTP. Participants were asked to use a five-point Likert to rate the importance of each item included in the survey.

Upon the completion of the initial draft of the instrument, an individual who serves as the director of a CTP and a teacher with the CTP were asked to review the instrument to determine if terminology and questions would align with participant knowledge and program demographics. Adjustments to the questions and answer options were made as suggested by these individuals. The researcher also consulted national experts who have worked and done research within a CTP setting or with individuals with ID in a postsecondary setting. These experts reviewed the new draft of the instrument in order to ensure that it would be easy to understand and complete for the potentially wide variety of participants.

In order to overcome factors that can lead to low survey responses, previous researchers have determined that a researcher can employ strategies to ensure that participants will provide high-quality responses. In order to avoid technical issues among participants, a survey should be tested using a wide variety of platforms in order to avoid difficulty when participants attempt to complete a survey (Andrews et al., 2017; Sheehan & Micmillian, 1999; Watt, 1999). Because participants may have diverse backgrounds and ability to utilize electronic survey platforms, the literature also suggests that researchers avoid requiring participants to have familiarity with specific survey software. Additionally, participants should not be able to alter the survey in any way (Sheehan & Hoy, 1999; Witmer et al., 1999).

In order to avoid potential technical issues due to the potential variety of participant devices, the researcher utilized an online survey platform to deploy the survey. Qualtrics is an online survey development and deployment platform that allows a user to create survey questions to be sent out to a large number of participants. Once a

survey is sent out, participants can complete the survey using any device. The survey was formatted in a way that was easy to read and complete and navigation was intended to be easy for a wide variety of participants. Because there is no specific program or application that needed to be downloaded by the participant, there was a lowered chance that participants would experience any issues with device compatibility or accessing the survey for completion.

Sheehan and McMillan (1999) as well as Watt (1999) suggest that the survey topic should be relevant to the participants in order to ensure that they are interested in completing the survey. The selected participants for the dissertation study were individuals who work in CTPs as directors, developers, coordinators, staff, teachers, peer mentors, or graduate assistants. These individuals work with individuals with ID in a postsecondary setting on a daily basis and should find this survey topic valuable because the results are intended to support the development of resources focused on technology use within their programs.

Sheehan (2001) suggests that an invitation to complete a survey should include a subject line, email address of the sender, and the sender's name. To accomplish this, the survey was distributed through collaboration with Think College. An individual who works for the Think College organization sent the survey link to a group of individuals who belong to a research affinity group within the organization. Additionally, the researcher personally reached out to the contacts listed for each CTP on the Think College Website.

The privacy of participants must be protected in all survey research, and answers to survey questions should remain confidential. Assurance of confidentiality did not

affect participant willingness to complete a survey; however, the sensitivity of the topic covered did have a significant effect on participant willingness to complete a survey (Couper, 2000). If a participant develops the perception that participation in a survey will put them or others at risk or cause harm, willingness to participate will decrease (Couper et al., 2008). In order to decrease participant concerns about completing the survey, the researcher ensured that information collected was not sensitive and assured participants that the information collected would not be used against them in any way.

Crawford et al. (2001) suggest allowing participants to view the entire survey before asking them to begin answering questions and letting participants know the amount of time it will take to complete the survey. These researchers also suggest that sending reminders to participants about survey completion is beneficial (Crawford et al., 2001). Additionally, the collection of demographic information can have an impact on participation completion. The best placement for demographic related questions depends on the format of the survey. Demographic information may be placed at the end of a survey if the research deploys the survey in a way that allows participants to view all questions and ensures that will not be surprised by the questions at the end.

During a personal interview with an expert in the field of technology use among individuals with ID at the postsecondary level, it was suggested that demographic information be placed at the end of the survey so that participants do not experience survey fatigue prior to answering the questions related to the research question (M. Grigal, personal communication February 1, 2019). Because this individual is an expert on adult transition programs in postsecondary settings and has experience with this type of research, the researcher followed this suggestion by placing the demographic questions

at the end of the survey. The researcher also ensured that the survey was formatted in a manner that allowed participants to see all survey questions before being required to answer any of the questions. This was accomplished by utilizing the features available in the Qualtrics platform. Deploying the survey in this way also helped participants to determine if the survey content is relevant to them and to estimate how long it will take to complete the survey.

The researcher also provided the estimated time the survey would take to complete at the beginning of the survey and in the invitation to complete the survey in order to let participants know up front how much time they would spend completing the survey. The goal of providing the time up front was to avoid participant uncertainty or apprehension to participate due to a lack of knowledge about how much of a time commitment they will need to complete the survey. In order to encourage survey completion at the beginning of the deployment phase, participants were given a deadline to complete the survey.

A survey tailored to the target population related to language, delivery method, and follow-up method represents a quality survey that will elicit higher response rates (Sheehan, 2001). The researcher had the survey instrument reviewed by specific individuals who work in settings related to the study in order to ensure that the language is easy to understand, and the survey questions were relevant to the intended participants. The researcher had the survey instrument reviewed by additional individuals preceding the deployment of the survey to the final target population, to ensure that the survey remained customized to the selected participants.

Field Test

In addition to employing strategies suggested by research, the researcher conducted a field test of the instrument with a select group of individuals prior to the implementation of the instrument for the study. Purposeful random sampling methodology was utilized to select participants outside of the study's target population. This method was utilized because there was no directory available to locate programs that were not a part of the Think College Directory. First, to determine which states would be included in the study, the researcher reviewed the Think College directory to determine which states had the highest number of programs. States with at least seven or more programs were targeted for the field test, because these states had begun to develop post-secondary programs for individuals with ID. There were eleven states that had seven or more programs. Next, the researcher randomly selected a number from one to five to determine the number of programs from each state that would be selected to include in the field test. The number selected was one. Purposeful random sampling was also used to determine which program from each state would be selected. The number selected was three. This determined that the third program in the list of programs from each state selected were selected to participate in the field test of the instrument. The researcher conducted a search to create a list of programs in each of the selected states in alphabetical order. Once the list was complete, the researcher selected the third program on the list. The researcher determined that all of the programs in Texas would be contacted since this state had an official directory of programs within the state.

The survey was sent to the list of participants for the field test via a link included in a personal email to the personnel listed on the program's website. The survey was administered to field test participants at the beginning of the fall 2019 semester. Data

collection methods for the field test were identical to the data collection methods described in the following section focused on data collection. This field test helped to establish the validity of the instrument and ensure that the questions were appropriate for the intended audience.

Participants and Setting

Participants for the study were selected based on the list of comprehensive transition programs published on the Think College website. This website provides the most current updated list of CTPs across the country. Each program that is listed has already gone through an extensive application process and has been reviewed and approved by the United States Department of Education as complying with the Higher Education Opportunity Act (HEOA). Because each of these programs has completed the application and approval process, the knowledge and experience of the personnel who work in these programs will have many similarities and differences that can be compared. The individuals working in the selected programs have a working knowledge of the needs of students enrolled in CTPs as well as the responsibility of these programs to prepare students for the workforce and future life in the community. This group of participants was selected for study due to their involvement in all aspects of a program and direct influence on the implementation and development of student use of technology. The specific demographic information that was collected from participants can be found in Appendix C. Collecting this information allowed the researcher to examine any relationships that may exist with specific program personnel demographics and the perceptions of the importance of each ISTE standard within the CTP Setting.

Sample

The target population included the program personnel employed at the 263 CTPs listed in the Think College Directory at the time of the study. Each program had at least one individual listed as the contact for the program and some programs had multiple individuals listed as program personnel. The survey instrument was deployed using an online survey platform and was sent via a Think College newsletter to subscribers and personal emails to directors and other program personnel. There were a total of 103 survey responses, however, 32 participants did not fully complete the survey. These entries were eliminated, resulting in a sample size of 71 program personnel.

Data Collection

Data from the survey instrument were collected through the use of the Qualtrics online survey platform (Qualtrics, Provo, UT). Information related to program personnel perceptions of technology-related skills were collected using the electronic survey instrument. The instrument was sent to the intended participants through a link in a Think College Newsletter as well as personal emails to program contacts listed in the Think College Directory and other program personnel located on program websites. Once the survey administration was complete, the quantitative data were entered into Statistical Package for the Social Sciences (SPSS), Version 25.0 for MAC software to prepare for statistical analysis.

Prior to being asked to complete any survey questions, participants were assured that no identifying information would be collected for the research project and that the online survey platform would maintain confidentiality (Couper, 2000; Couper et al., 2008). To protect confidentiality, no program names were collected and therefore are not present in the research report.

The survey instrument included an introductory section including information about informed consent. This section explained the research study, procedures, risk, and estimated time to complete the survey. Respondents were assured that participation was voluntary and were asked to indicate if they understood and agreed to participate or if they did not wish to participate in the study. For those that selected they did not wish to participate, the survey was terminated, and no additional information was collected. Participants who indicated consent to participate were given access to the survey. The exact wording of the informed consent introductory section is included as Appendix B.

In order to keep all data collected secure, all data and digital files were stored on the researcher's password-protected computer. The only individuals who had access to the raw data were the researcher and dissertation committee. The survey was administered to participants the during the fall 2019 semester. After consulting the dissertation chair and methodology committee member, the researcher closed the survey window once the Qualtrics software indicated that 103 responses were collected and that a reasonable amount of time had passed in which no additional responses had been submitted.

Data Analysis

The SPSS software was used for all data analysis of the quantitative data collected for the study. Prior to the analysis of data, the 28 Likert-scale questions focused on digital-age skills were grouped into clusters based on the ISTE standards indicator in which the skill fell under. Once 7 clusters were created, the average score for each cluster was generated. Descriptive statistics were generated for each of the 7 clusters in order to answer research question one. The descriptive statistics for these questions included the

mean scores and standard deviation for each cluster. To answer research question two, Pearson correlation analysis was performed to determine if any correlations existed between the average scores for each cluster and any demographics or program-related information collected. Once data were collected, a Chronbach's Alpha test was conducted using the SPSS analysis software in order to determine the instrument's reliability. Results indicated that the instrument was reliable with an alpha coefficient of .93.

Summary

Chapter 3 provided details of the methods and procedures implemented to provide an understanding of the perceptions of program personnel on the importance of technology-related skills in CTP programs. The chapter also provided a description of the field test procedures, a description of the selected participants and setting, and detailed the process for data collection. An overview of the data analysis procedures used to answer the research questions was provided. Chapter 4 will provide the results of the study based on the analysis of data collected.

CHAPTER IV

Results

This quantitative research study utilized an electronic survey instrument to determine the digital-age skills identified as valuable to address within a program by individuals who work in a CTP. Chapter 4 presents the results of the descriptive statistics analysis conducted on the seven clusters of digital-age skills followed by the results of Pearson correlation analysis. The chapter concludes with the statistically significant correlations that exist between the digital age skills ratings by CTP personnel and the demographics and program-related information collected.

Response Rate to the Survey Research

Quantitative data were collected from CTP personnel who worked in a program listed in the Think College Directory. The total number of survey responses at the end of the survey window was 103. A total of 32 responses were deleted due to incomplete submission. This resulted in a sample of 71 ($N = 71$) for the study.

Data Analysis Procedures

The survey was deployed in the fall semester of 2019. The population of the study consisted of 71 CTP personnel serving in various capacities. Program personnel from 265 programs were invited to participate in the study. The number of programs that were represented by this group of participants is unknown due to the fact the survey responses were completely anonymous.

An invitation to participate in the study was sent to program personnel through a Think College Newsletter and a personal email from the researcher. The invitation explained the purpose of the study and included a link to the survey. As previously

mentioned, the survey was housed online by Qualtrics. Data were collected and then analyzed using SPSS Statistics, Version 25.0 for MAC software.

Research question one was analyzed using descriptive statistics as well as means and standard deviations of each ISTE Standard Cluster. The mean provided the central tendency for each of the clusters. The standard deviations provided an explanation for potential variations for each distribution. Research question two was analyzed using a Pearson *r* correlation to determine if any relationships exist between the ISTE standard cluster ratings and the demographic data collected.

Demographic Data

The survey instrument included questions intended to produce specific demographic data about the participants and programs in which they worked. These questions related to their personal demographics, years in which they worked in various specific settings, their role within the program, and some specific information about the program they represented. Tables 1 through 13 show the results of these questions.

The first demographic question asked participants to identify their gender. Ten participants indicated that they were male and represented 14.1% of the sample. Sixty participants indicated that they were female and represented 84.5% of the sample. One participant indicated that they prefer not to answer the question. This represented 1.4% of the sample (see Table 1).

Table 1

Participant Gender

Gender	*n*	%
Male	10	14.1
Female	60	84.5
Prefer not to answer	1	1.4

Note. $N = 71$

The next question asked participants to classify their age. A total of 26 participants were 39 years of age or younger, representing 36.6% of the sample. A total of 28 participants were between 40 and 59 years of age, representing 39.4% of the sample. A total of 16 participants were between 60 and 79 years of age, representing 22.5% of the sample (see Table 2).

Table 2

Participant Age

Age in years	*n*	%
0 - 29	11	15.5
30 - 39	15	21.1
40 - 49	16	22.5
50 - 59	12	16.9
60 - 69	15	21.1

(Table 2 cont.)

70 - 79	1	1.4
Prefer not to answer	1	1.4

Note. $N = 71$

Participants were also asked to indicate their ethnicity. A total of two participants were American Indian or Alaska Native, representing 2.8% of the sample. A total of four participants were African American, representing 5.6% of the sample. A total of one participant was Hispanic, Latino, or of Spanish Origin, representing 1.4% of the sample. A total of 63 participants were Caucasian, representing 88.7% of the sample (see Table 3).

Table 3

Participant Ethnicity

Ethnicity	*n*	%
American Indian or Alaska Native	2	2.8
Black or African American	4	5.6
Hispanic, Latino, or Spanish Origin	1	1.4
Caucasian	63	88.7
Prefer not to answer	1	1.4

Note. $N = 71$

Question four asked participants to select their highest level of degree. A total of four participants had a high school diploma, some college credit, or an associate degree. This made up 5.6% of the sample. A total of 17 participants indicated that a bachelor's degree was their highest level of education, representing 23.9% of the sample. A total of 35 participants held a master's or specialist degree, representing 49.3% of the sample. A total of 15 participants held an academic, applied, or professional doctorate, representing 21.1% of the sample (see Table 4).

Table 4

Participant Highest Level Degree

Degree type	*n*	%
High school diploma or equivalent	1	1.4
Some college	2	2.8
Associate degree	1	1.4
Bachelor's degree	17	23.9
Master's degree	34	47.9
Specialist degree	1	1.4
Academic Doctorate degree	14	19.7
Applied or Professional Doctorate degree (MD, PharmD, JD, etc.)	1	1.4

Note. $N = 71$

The next question asked participants to enter their years of experience in a P - 12 setting. Not all participants opted to answer this question. A total of 45 participants had nine or fewer years of experience in a P-12 setting, representing 63.2% of the sample. A total of 18 participants had 10 to 29 years of experience in this setting, representing 25.3% of the sample. A total of five participants had 30 - 49 years of experience in this setting, representing 5.6% of the sample (see Table 5).

Table 5

Participant Years of Experience in a P-12 Setting

Experience in years	*n*	%
0 - 4	34	47.8
5 - 9	11	15.4
10 - 19	12	16.9
20 - 29	6	8.4
30 - 39	4	5.6
40 - 49	1	1.4
No response	3	4.2

Note. N = 71

The survey asked participants to indicate how many years they had worked in a post-secondary setting. A total of 48 participants had 9 or fewer years of experience in a post-secondary setting, representing 66.5% of the sample. A total of 21 participants had between 10 and 29 years of experience in this setting, representing 29.4% of the sample.

One participant had over 30 years of experience in this setting, representing 1.4% of the sample (see Table 6).

Table 6

Participant Years of Experience in a Post-Secondary Setting

Experience in years	*n*	%
0 - 4	26	35.6
5 - 9	22	30.9
10 - 19	14	19.6
20 - 29	7	9.8
30 - 39	1	1.4
No response	1	1.4

Note. N = 71

The survey also asked participants to indicate the years of experience they had working with individuals with disabilities at the P - 12 or post-secondary level. A total of 26 participants had 9 or fewer years of experience working with individuals with disabilities, representing 36.5% of the sample. A total of 39 participants had between 10 and 29 years of experience, representing 54.7% of the sample. Six participants had over 30 years of experience, representing 8.4% of the sample (see Table 7).

Table 7

Participant Years of Experience Working with Individuals with Disabilities

Experience in years	*n*	%
0 - 4	14	19.7
5 - 9	12	16.8
10 - 19	24	33.6
20 - 29	15	21.1
30 - 39	5	7.0
40 - 49	1	1.4

Note. N = 71

The survey also asked participants to indicate their role within the transition program they worked in. Five participants indicated that they were a program developer, representing 7% of the population. A total of 43 participants were program directors or developers. This represented 60.6% of the population. A total of 11 participants were program staff, representing 15.5% of the population. Five participants were program teachers, representing 7% of the population. One participant was a peer mentor or graduate assistant, representing 1.4% of the population. Six participants selected that they held some other position within the program, representing 8.5% of the population (see Table 8).

Table 8

Participant Role Within the Transition Program

Role	*n*	%
Program developer	5	7.0
Program director or coordinator	43	60.6
Program staff	11	15.5
Program teacher	5	7.0
Peer mentor or graduate assistant	1	1.4
Other	6	8.5

Note. N = 71

Participants were asked to indicate the total number of years they held their current position. A total of 39 participants held their current position for four or fewer years, representing 54.9% of the population. Twenty participants held their current position between five and nine years, representing 28.1% of the population. Eleven participants held their current position between 10 and 19 years, representing 15.4% of the population. One individual held their position between 20 and 29 years, representing 1.4% of the population (see Table 9).

Table 9

Participant Years in Current Position

Years	*n*	%
0 - 4	39	54.9
5 - 9	20	28.1
10 - 19	11	15.4
20 - 29	1	1.4

Note. $N = 71$

The survey asked participants to indicate the degree to which they are involved in the admission process for students in the program. A total of 51 participants indicated that they were very involved in the admission process for all students, representing 71.8% of the population. Twelve participants indicated that they were somewhat involved in the admission process for some students, representing 16.9% of the population. Eight participants indicated that they were not involved in the admission process, representing 11.3% of the population (see Table 10).

Table 10

Participant Degree Involved in Admission Process

Degree involved	*n*	%
Very involved for all admitted students	51	71.8
Somewhat involved for some admitted students	12	16.9
Not involved in the admission process	8	11.3

Note. $N = 71$

Participants were asked to indicate the geographic location in which the program they work in is located. Twenty-three participants selected that their program was located in the northeast region of the country, representing 32.4% of the population. Eleven participants selected that their program was from the northwest region of the country, representing 15.5% of the population. Twenty-seven participants selected that their program was from the southeast region of the country, representing 38% of the population. Ten participants selected that their program was from the southwest region of the country, representing 14.1% of the population (see Table 11).

Table 11

Program Geographic Location

Location	*n*	%
Northeast	23	32.4
Northwest	11	15.5
Southeast	27	38.0
Southwest	10	14.1

Note. $N = 71$

The survey asked participants to classify the length of the program in which they work. Three participants indicated that the program they work in was one year in length, representing 4.2% of the population. Twenty participants indicated that the program was two years in length, representing 28.2% of the population. Seven participants indicated that the program was three years in length, representing 9.9% of the population. Eleven participants indicated that the program was four years in length, representing 15.5% of the population. Twenty-four participants indicated that the program's length varied from student to student. This represented 33.8% of the population. Six participants selected the other option for the length of the program question, this represented 8.5% of the population (see Table 12).

Table 12

Length of Program

Program Length	*n*	%
1 year	3	4.2
2 years	20	28.2
3 years	7	9.9
4 years	11	15.5
Varies from student to student	24	33.8
Other	6	8.5

Note. $N = 71$

The last question in the demographic section of the survey asked participants to indicate the disabilities students in the program have. Participants were asked to select all that apply for this question. They were allowed to select one, two, or all three of the response options. Sixty-nine participants indicated that students in the program had intellectual disability, representing 97.2% of the population. Sixty-five participants indicated that students in the program had autism spectrum disorder, representing 91.5% of the population. Thirty-one participants indicated that students in the program had some other disability, representing 43.7% of the population.

Table 13

Disabilities of Students in the Program

Disability	*n*	%
Intellectual Disability	69	97.2
Autism Spectrum Disorder	65	91.5
Other	31	41.7

Note. $N = 71$

Instrument Validity and Reliability Analysis

According to Laerd Statistics (n.d.), ". . .[it is not possible] to demonstrate construct validity in a single study, although it is good practice. . .when you approach a study wanting to establish as much construct validity as possible." In order to establish construct validity, a researcher must address other forms of validity such as content validity (Laerd Statistics, n.d..). Content validity of the instrument was addressed through multiple rounds of review by a CTP director and teacher as well as experts in the field. These individuals were asked to review the instrument and provide feedback based on their experience in the setting to be studied as well as their knowledge of the topic being studied. Feedback provided helped the researcher strengthen the content validity of the instrument in order to ensure that the intended constructs were being measured.

The researcher tested the reliability of the instrument using the SPSS software. As mentioned in the previous chapter, reliability was measured using Chronbach's alpha. For the instrument used in this study, reliability refers to the internal consistency of the instrument. This measure should be used to determine the reliability of a Likert-scale

survey instrument (Gliem & Gliem, 2003). A Chronbach's alpha analysis of the instrument produced an alpha coefficient of .93. According to George and Mallery (2003) an alpha coefficient greater than .9 is considered excellent so the instrument may be considered reliable.

Table 14

Overall Instrument Reliability

α	*n/items*	*n/cases*
.93	28	71

Research Question 1

How are ISTE standard related digital skills rated by CTP personnel? Which of the skills are rated as most important by CTP personnel?

The first research question focused on the average ratings of ISTE standard related skills by CTP personnel. Participants were asked to rate a series of questions directly related to the ISTE standards for students (see Appendix C). Participants were provided with a rating scale from one to five. One represented very important and five represented not at all important. Responses were grouped into clusters for each standard and the mean and standard deviation of each cluster was calculated to determine which was rated as most important. Of the seven clusters of standards, Digital Citizen was rated the most important by CTP personnel. Empowered was rated the second most important, Knowledge Constructor was rated third, Creative Communicator fourth, Innovative designer fifth, and Global Collaborator sixth. Computational Thinker was rated the least

important by CTP personnel. Readers are referred to Table 15 for the descriptive statistics concerning the ratings of each cluster of ISTE standard related skills.

Table 15

Descriptive Statistics for CTP Personnel Rating of Each ISTE Standard Cluster

ISTE Standard Cluster	*n*	*M*	*SD*
Empowered Learner	71	1.49	0.43
Digital Citizen	71	1.19	0.31
Knowledge Constructor	71	1.77	0.65
Innovative Designer	71	2.44	0.83
Computational Thinker	71	2.91	0.86
Creative Communicator	71	2.11	0.76
Global Collaborator	71	2.50	1.01

Research Question 2

Are there any relationships between the top-rated digital age skills and the characteristics of the participants or settings in the study?

The second research question focused on the correlation between the ratings of each ISTE standard by CTP personnel and participant or program demographics. To examine research question 2, a Pearson *r* analysis was calculated to determine whether there was a significant correlation between the average ratings of the ISTE standard clusters and selected demographic characteristics collected (See Appendix D). Questions in which the data collected were not numerical were excluded from the data analysis

since they could not be used to calculate correlation. Selected variables were participant gender, age, highest level of education, role within the transition program, degree involved in the admission process, geographic location of the program, and length of the program because responses could be represented numerically. The results of the correlation analysis are presented in Table 16.

Table 16

Pearson's r Correlation Results

Variables	Gender	Age	Highest Level of Education	Role Within the Transition Program	Degree involved in the Admission Process.	Geographic Location	Length of the Program
Empowered Learner	0.113	-.395**	-.289*	0.146	0.077	0.117	-0.107
Digital Citizen	-0.046	-.299*	-0.062	0.006	-0.124	0.199	-0.070
Knowledge Constructor	0.034	-0.233	-0.092	-0.049	-0.066	0.060	-0.056
Innovative Designer	0.018	-.237*	0.031	0.009	0.040	0.043	0.081

Variables	Gender	Age	Highest Level of Education	Role Within the Transition Program	Degree involved in the Admission Process.	Geographic Location	Length of the Program
Computational Thinker	0.005	-0.052	-0.022	-0.090	0.053	0.102	-0.070
Creative Communicator	-0.078	-0.063	-0.109	0.038	0.032	0.111	-0.008
Global Collaborator	-0.087	-0.161	-0.143	-0.077	-0.032	0.160	-0.057

Note: **. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

For the correlation between average Empowered Learner and participant age, the finding was statistically significant, $r(70) = -.395$, $p < 0.01$. An approaching moderate statistically significant relationship was revealed between the average rating of the Empowered Learner cluster and participant age. According to Cohen's (1998) values, the *r* value indicated a moderate relationship.

For the correlation between the average rating of the Digital Citizen cluster and participant age, the finding was statistically significant, $r(70) = -.299$, $p<.0.05$. A low statistically significant relationship was revealed between the average rating of the Digital Citizen cluster and participant age. According to Cohen's (1998) values, the *r* value indicated a small relationship.

For the correlation between the average rating of the Innovative Designer cluster and participant age, the finding was statistically significant, $r(70) = -.237$, $p<.0.05$. A low statistically significant relationship was revealed between the average rating of the Innovative Designer cluster and participant age. According to Cohen's (1998) values, the *r* value indicated a small relationship.

Summary

Chapter IV included a description of the data analysis procedures used to answer the research questions of the study. Descriptive statistics were presented for the ISTE standard cluster ratings as well as the demographic information collected via the electronic survey instrument. To answer research question one, the descriptive statistics were used to determine how CTP rated the ISTE standards and which of the standard clusters was rated the highest. Results revealed that the Digital Citizen cluster was rated as most important to address in a CTP by program personnel. For research question two,

a Pearson correlation revealed a statistically significant relationship between the average ratings of the Empowered Learner, Digital Citizen, and Innovative Designer clusters and the age of participants.

CHAPTER V

Conclusions

The study was conducted to determine the value CTP personnel place on digital-age skills. Another purpose was to determine if there were any correlations between the digital-age skills identified as important and the participant or program characteristics. Chapter 5 includes a summary of the statement of the problem, a review of the methods, and a review of the findings. The chapter will also present an interpretation of the findings and discuss the relationship between the findings and the literature. Implications for current practice aand recommendations for future research are also discussed.

Summary of Purpose

The number of CTPs has steadily increased over the past several years as federal and state support for these programs has increased (Papay & Griffin, 2013). The goal of these programs is to support individuals with ID to build skills needed to become independent and productive members of society (Think College, n.d.-c). In order to truly prepare these individuals, CTPs must be able to prepare them for the current digital-age where individuals use technology and other digital-age skills in most aspects of life (Oraison, Konjarski, & Howe, 2019). The purpose of this study was to quantitatively determine which digital-age skills are deemed as valuable by individuals who work in a CTP setting.

The researcher sought to determine the most important ISTE standard related digital-age skills to address in a CTP and to determine if any correlations existed between the most important skills and participant or program characteristics through the following questions that guided the study:

1. How are ISTE standard related digital skills rated by CTP personnel?
    a. Which of the skills are rated as most important by CTP personnel?
2. Are there any relationships between the top rated digital age skills and the characteristics of the participants or settings in the study?

Summary of Procedures

Data were collected using a Likert scale survey that was completed by a total of 71 CTP personnel. The instrument was developed by the researcher to assess program personnel's value for specific digital-age skills. The survey instrument determined program personnel ratings of ISTE standard related skills in the following categories: empowered learner, digital citizen, knowledge constructor, innovative designer, computational thinker, creative communicator, and global collaborator. Section one of the survey focused on questions to determine how important program personnel felt it was to address ISTE standard-related skill with students enrolled in a CTP. Section two was used to collect demographic information from participants. The instrument was developed because there were no studies that had been conducted on the ISTE standards in this particular setting. There was no instrument in existence that could be utilized to collect data related to the research questions. To establish validity and reliability, the instrument was reviewed by experts in the field and a Cronbach's alpha analysis was run.

The participants in the study consisted of CTP personnel working in programs across the country listed in the Think College directory. To collect responses, the survey was sent to potential participants through a Think College newsletter. The survey was also sent in a direct email to program personnel that worked at the 265 programs listed in the Think College directory at the time of the study. A total of 71 complete responses

were collected. Although over 260 programs were listed in the directory at the time, the researcher was unable to determine how many programs were represented in the data due to the anonymous nature of the survey. Participation in the study was voluntary and participants had their confidentiality protected since all responses were anonymous. No specific programs were identified in any way throughout the study.

The survey was created and housed on the Qualtrics online survey platform. Data collected were analyzed using SPSS Statistics software. Descriptive statistics, including means and standard deviations, were used to examine research question one. Descriptive statistics were also used to examine the demographic characteristics of the participants and the programs in which they worked. To answer research question two, Pearson's *r* was used to determine if any statistically significant correlations were present between the ISTE standards ratings and selected demographic characteristics.

Discussion of Results

The survey instrument collected data from program personnel working in a CTP program in the United States. Seventy-one participants completed the survey. This study is an important contribution to the field since digital skills in CTPs have not been the focus of much research and there have not been any studies that examined the ISTE standards specifically in relation to individuals enrolled in a CTP (Maich et al, 2018; White et al., 2016). The results of this study may help to determine which ISTE standard related digital skills should be addressed within CTP services provided to postsecondary students with ID.

Research Question One

The first research question asked CTP personnel to rate how important ISTE standard related digital skills were to address with students with ID. Findings suggest that CTP personnel rate skills related to Digital Citizenship as the most important to address with students enrolled in a CTP. Participants were asked to rate the standards on a scale of one to five. A rating of one represented very importtant and a rating of five represnted not at all important. The Digital Citizenship clustter which had an average rating of 1.9 was identified as the most important skill according to CTP personnel. These results align with current literature which indicates that focusing on the development of a student's digital citizenship can impact their ability to become productive members of our current technology-driven society (ISTE, 2016; Ribble, 2015;). Findings also echo the findings of Lenhart (2015) which focused on the current status of technology use by teens and young adults. If individuals with ID are not able to use digital citizenship skills to take advantage of the opportunities to obtain education, seek employment, or communicate with others on a global level, they may miss out on true involvement in the digital society that has emerged over the past several years (Ribble, 2015).

To support the development of digital citizenship skills, CTP personnel should implement lessons and activitites to assist individuals with ID in uderstanding the importance of these skills. This can be achieved by using many of the resources already developed such as Google's Be Internet Awesome platform or Common Sense Education's library of resources focused on digital citizenship. Both of these reserouces were created to facilitate the development of digital citizen among students (Google, n.d;

Common Sense Media, n.d.). Additionally, in order to make a significant impact, digital citizenship resources specific to a CTP setting may need to be developed.

CTP personnel also rated skills related to the Empowered Learner and Knolwedge Constructor standards as more important than the remaining standards. These standard clusters earned an average rating of 1.49 and 1.77 respectively. This aligns with several studies focused on each of these ISTE Standards. Enedy (2014), led the initiative to incorporate technology use throughout all parts of the learning process in order to encourage students to take ownership of their learning. In order to be successful in the 21st-century workforce, individuals with ID must develop ownership of their learning (Ferguson et al., 2015; Freeland, 2014; Gerstein, 2016; McCcombs, n.d.; Tullis & Bemjamin, n.d.). In order to develop understanding of new concepts, individuals with ID must be able to construct knowledge, or curate information, using a variety of digital sources. Focusing on the development of curation skills can lead to higher digital and media literacy (Leu et al., 2011; Cohen et al., 2013). As a result, higher academic success can be achieved for students enrolled in CTP programs.

To support the development of empowered learner and knowledge constructor skills, CTP personnel should also implement lessons and activities to assist individuals with ID with the development of these skills. The Empowered Learning ISTE standard focuses on students being able to use technology to achieve personalized learning goals, build customized learning environments, demonstrate learning in a variety of ways, and that they understand basic technology operations (ISTE, n.d-a.). Personalized learning, a characteristic of many CTPs, is one way to encourage students to take ownership of their learning. To encourage individuals with ID to develop more empowered learning skills,

program personnel could develop more opportunities for students to design their own learning opportunities with the use of technology (Grant & Basye, 2014). Program personnel should also ensure that students are able to use technology to maximize their learning opportunities by seeking out online learning opportunities and seeking out feedback to improve learning. Finally, they should ensure that individuals with ID develop basic technology skills and understand how to troubleshoot problems that may occur when using technology.

Knowledge Constructor related skills can be developed by providing opportunities for individuals with ID to build knowledge using digital tools in order to create meaningful learning experiences. Skills related to this ISTE standard focus on students understanding research strategies, ability to locate information relevant to their learning, critically evaluating online resources and media, collect information from a variety of digital resources and using a variety of tools, and developing ideas about how to solve real-world problems (ISTE, n.d-a). As previously discussed, the goals of a CTP are to assist in the development of knowledge and skills among individuals with ID. In order to help students meet the Knowledge Constructor standard, program personnel may need to be more intentional about incorporating technology and online resources when helping students to develop knowledge and skills. Resources related to empowered learner and knowledge constructor skills specific to a CTP setting may need to be developed in order to have a meaningful impact.

Research Question Two

Data analysis indicated that there was a small relationship between three of the ISTE standard cluster ratings and program personnel age. For the ratings of the Digital

Citizen, Empowered Learner, and Innovative Designer clusters, there was a greater chance that younger participants found these skills less important. This relates to a study conducted by Cristol and Gimbert (2018), which dtermined that there was some positive correlation between age and the critical processing aspect of digital citizenship. Interestingly, these findings contradict literature that suggests that individuals considered digital immigrants, those who did not grow up using digital tools react less positively to digital skill concepts than digital natives born after 1980 who grew up using digital tools (Kirk et al., 2015).

Aside from age, there were no other significant relataionships between program personnel characteristics and their ratings of the ISTE standards. Since there are no strong significant correlation between demographics and ratings, this indicates that CTP personnel ratings of the ISTE Standard related skills are not impacted by characteristics such as gender, ethnicity, years of experience, or any of the other characteristics collected about program personnel. There were also no correlations between program personnel ratings and characteristics related to the CTP such as location, length of the program, or disabilites of students in the program.

Implications for Practice

The findings of this study were based on data collected from program personnel working in a CTP. The results of this study are relevant to individuals with ID and their family members. It is also relevant to secondary teachers and other support personnel who work with individuals with ID at the high school level, university faculty and staff who work with individuals with ID, and other organizations who provide support for individuals with ID. Findings suggest that the CTP personnel perceived importance of the

ISTE Standard related skills is not impacted by any specific characteristics. Any resources or materials focused on developing ISTE standard related skills among students enrolled in a CTP do not need to be created with program personnel demographics or program demographics in mind. Results of the study support the development of resources focused on ensuring that students enrolled in a CTP develop important digital-age skills such as digital citizenship, knowledge constructor, and empowered learner skills. To facilitate the development of these skills among individuals with ID, program personnel may need resources and training they can use to help meet this need within their programs. The development of these resources is especially important if program personnel are not familiar with these particular skills or are not sure how to facilitate the development of these skills. Collaboration between program personnel and individuals who are experts in the educational technology field is a logical next step. A collaborative effort between these groups of individuals will help to create resources that have the most positive impact on individuals with ID in a CTP and other settings.

Recommendations for Further Study

Research suggests that family members, school personnel, and other agencies who work with individuals with ID have a huge impact and investment in their success (Henninger & Taylor, 2014; Hanley-Maxwell et al, 1995); Ivey, 2004; Beadle-Brown et al. 2015). Additional studies of this nature could be conducted with a focus on participants such as the students who are enrolled in a CTP, their parents and other family members, or professionals who employ individuals with ID. Focusing on other participants could lead to a better understanding of the digital-age skills that are

important for individuals with ID to develop in order to be successful when it comes to the social, independent living, and meaningful employment aspects of life

Additionally, studies using qualitative methodology may be helpful in gaining insight into the need for a focus on the development of digital-age skills among individuals with ID enrolled in a CTP. This type of study could provide insight into the quantitative data collected in order to understand why participants rated the ISTE standard skills in the way they did. Qualitative data could also provide support for the development of resources that assist CTPs in facilitating the development of digital-age skills among students enrolled.

Studies on this topic could also be conducted in other settings such as K-12 school settings where, according to ISTE, it is important to begin facilitating the development of digital age skills (ISTE 2016). Students of all ages could benefit from the development of digital-age skills. A study in this setting may not only inform practices for teaching digital age skills to individuals with ID, but to all students at any grade level.

Since there was a weak correlation found between age and program personnel ratings of the Digital Citizen, Empowered Learner, and Innovative Designer skills, more research should be conducted in order to better understand this finding. It is unclear if this result would be replicated in additional studies due to the small sample size of the current study. Additionally, qualitative data could be collected to gain insight into why younger people seem to find these particular skills less important and why older people would find these skills more important.

Finally, a study focused on the specific skills and activities that should be included in any resources to be created might also provide impactful information. Data

collected from a variety of stakeholders could be used to determine what resources should consist of and the method in which they should be deployed. Such research may lead to the development of strategies and practices that could benefit future learning experiences of individuals with ID.

Conclusions of the Study

Ensuring that individuals with ID develop digital skills are important to ensuring they are successful throughout their lives. The impact of technology on almost every aspect of life makes it important to ensure that individuals understand how to properly use technology and digital-age skills to navigate life in the 21st century. This study identified the most important digital-age skills to address with students enrolled in a CTP program as suggested by program personnel. The study also determined that they were no statistically significant relationships between program personnel ratings of ISTE standard related digital-age skills and any personnel or program characteristics.

The study determined that any resources created to facilitate the development of digital-age skills among individuals in a CTP should address digital citizenship, knowledge constructor, and empowered learner skills. Ensuring that individuals with ID in a CTP develop skills such as these will allow them to take full advantage of the postsecondary educational opportunity, they are involved in by helping them to achieve academic success. The development of these digital-age skills can also lead to more meaningful independent living, job-opportunities, and social involvement in the 21st century society.

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APPENDIX A

ISTE Standards for Students

1. Empowered Learner

   Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

   a. articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
   b. build networks and customize their learning environments in ways that support the learning process.
   c. use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
   d. understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

2. Digital Citizen

   Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. Students:

   a. cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
   b. engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
   c. demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
   d. manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

3. Knowledge Constructor

   Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:

   a. plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
   b. evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.
   c. curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
   d. build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

4. Innovative Designer

   Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

   a. know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
   b. select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
   c. develop, test and refine prototypes as part of a cyclical design process.
   d. exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

5. Computational Thinker

   Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

   a. formulate problem definitions suited for technology- assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
   b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
   c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
   d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. Creative Communicator

   Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:

   a. choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
   b. create original works or responsibly repurpose or remix digital resources into new creations.
   c. communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
   d. publish or present content that customizes the message and medium for their intended audiences.

7. Global Collaborator

   Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. Students:

   a. use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
   b. use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
   c. contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
   d. explore local and global issues and use collaborative technologies to work with others to investigate solutions.

   (ISTE standards for students, n.d.)

APPENDIX B

Survey Instrument Informed Consent

Sam Houston State University

Consent for Participation in Research

DETAILED CONSENT *Program Personnel's Value of Digital-age Skills in Comprehensive Transition Programs*

Informed Consent

My name is *Sara Dempster* and I am a graduate student of the *Department of Library Science* at Sam Houston State University. I would like to take this opportunity to invite you to participate in a research study of *digital skills in comprehensive transition programs*. I hope that data from this research will *help to determine the digital-age skills identified as valuable to address in a comprehensive transition program and if any relationship exists between the characteristics of participants or program settings and the digital age skills identified as valuable*. You have been asked to participate in the research because *you work in a comprehensive transition program listed in the Think College directory*.

The research is relatively straightforward, and we do not expect the research to pose any risk to any of the volunteer participants. If you consent to participate in this research, you will be asked to *complete an anonymous online survey*. Any data obtained from you will only be used for the purpose of *determining the digital skills important to address in a comprehensive transition program*. Under no circumstances will you or any other participants who participated in this research be identified. In addition, your data will remain confidential. *Your survey responses will be kept confidential to the extent of the technology being used. Qualtrics collects IP addresses for respondents to surveys they host; however, the ability to connect your survey responses to your IP address has been disabled for this survey. That means that I will not be able to identify your responses. You should, however, keep in mind that answers to specific questions may make you more easily identifiable. The security and privacy policy for Qualtrics can be viewed at https://www.qualtrics.com/security-statement/.*

This research will require about *10 - 15 minute*s of your time. Participants will not be paid or otherwise compensated for their participation in this project.

Your participation in this research is voluntary. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled. If you have any questions, please feel free to ask me using the contact information below. If you are interested, the results of this study will be available at the conclusion of the project.

If you have any questions about this research, please feel free to contact me, *Sara Dempster*, or *Dr. Vickie Mitchell*. If you have questions or concerns about your rights as research participants, please contact Sharla Miles, Office of Research and Sponsored Programs, using her contact information below.

Sara Dempster SHSU *Department of Library Science* Sam Houston State University Huntsville, TX 77341 Phone: (936) 294-*3911* E-mail: sed031@shsu.edu	*Dr. Vickie Mitchell* SHSU *School of Teaching and Learning* Sam Houston State University Huntsville, TX 77341 Phone: (936) 294-*3911* E-mail: vmitchell@shsu.edu	Sharla Miles Office of Research and Sponsored Programs Sam Houston State University Huntsville, TX 77341 Phone: (936) 294-4875 Email: irb@shsu.edu

APPENDIX C

Survey Instrument

The purpose of this survey is to understand the importance of technology-related skills in comprehensive transition programs according to experts in the field. Questions are directly aligned to the 2017 ISTE Standards for students. Please select the number that best represents your opinion about each of the statements.

Scale:

1	2	3	4	5
Very important	Somewhat important	Neutral	Not very important	Not at all important

1. The following questions relate to students as empowered learners. **Empowered Learner:** Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
   How important is it for students in your program to be able to…
   1a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
   1b. Build networks and customize their learning environments in ways that support the learning process.
   1c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
   1d. Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

2. The following questions relate to students as digital citizens. **Digital Citizen:** Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.
   How important is it for students in your program to be able to...

   2a. Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

2b. Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
2c. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
2d. Manage their personal data to maintain digital privacy and security and are aware of data- collection technology used to track their navigation online.

3. The following questions relate to students as knowledge constructors. **Knowledge Constructor:** Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

   How important is it for students in your program to be able to...

   3a. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
   3b. Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.
   3c. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
   3d. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

4. The following questions relate to students ats innovative designers. **Innovative Designer**: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

   How important is it for students in your program to be able to...

   4a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
   4b. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
   4c. Develop, test and refine prototypes as part of a cyclical design process.
   4d. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

5. The following questions relate to students as computational thinkers **Computational Thinker:** Students develop and employ strategies for understanding and solving

problems in ways that leverage the power of technological methods to develop and test solutions.
How important is it for students in your program to be able to...

5a. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
5b. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
5c. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem- solving.
5d. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. The following questions relate to students as creative communicators. **Creative Communicator:** Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
How important is it for students in your program to be able to...

6a. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
6b. Create original works or responsibly repurpose or remix digital resources into new creations.
6c. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
6d. Publish or present content that customizes the message and medium for their intended audiences.

7. The following questions relate to students as global collaborators. **Global Collaborator:** Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
How important is it for students in your program to be able to…

7a. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
7b. Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

7c. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

7d. Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

APPENDIX D

Background Information

Please answer the following questions about yourself and the program you work in or are associated with.

1. What is your gender?

- Male
- Female
- Other
- Prefer not to answer

2. What is your age?

- 20 - 29
- 30 - 39
- 40 - 49
- 50 - 59
- 60 - 69
- 70 - 79
- 80 or older
- Prefer not to answer

3. What is your ethnicity? Select all that apply to you:

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic, Latino or Spanish Origin
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- White
- Some other race, ethnicity, or origin, please specify: _____
- I prefer not to answer

4. Please select your highest level of education

- High school diploma or equivalent
- Some college
- Associate's degree
- Bachelor's degree
- Master's degree
- Specialist degree
- Applied or professional doctorate degree
- Doctorate degree

- Other, please specify: _____

5. Please enter your years of experience in a P - 12 setting.

6. Please enter your years of experience in a postsecondary setting.

7. Please enter your years of experience working with individuals with disabilities at the P - 12 or higher postsecondary level.

8. Please select your role within the program.

- Program Developer
- Program Director or Coordinator
- Program Staff
- Teacher within the Program
- Peer Mentor or Graduate Assistant
- Other, please specify: _____

9. Please indicate the degree to which you are involved in the admission process for students in your program.

- Very involved for all admitted students
- Somewhat involved or involved for some admitted students
- Not involved in the admission process

10. Please enter the total number of years of your current position.

11. What geographic location is the program you represent located in?

- Central United States Region
- Northeast
- Northwest
- Southeast
- Southwest

12. What is the length of your program?

- 1 year
- 2 years
- 3 years
- 4 years
- Varies from student to student.
- Other, please specify: _____

13. What disabilities do students in your program have? (select all that apply)

- Intellectual Disability
- Autism Spectrum Disorder
- Other, please specify: _____

VITA

Sara E. Dempster

EDUCATION

Doctor of Education in Instructional Systems Design and Technology at Sam Houston State University, August 2016 - Present. Dissertation title: "Program Personnel's Value of Digital Age Skills in Comprehensive Transition Programs."

Master of Education (December 2015) in Educational Technology Leadership at Nicholls State University, Thibodaux, Louisiana.

Bachelor of Science (December 2013) in Birth to Five/Early Interventionist Education at Nicholls State University, Thibodaux, Louisiana.

EMPLOYMENT & TEACHING EXPERIENCE

Instructor and Clinical Experience Coordinator, Department of Teacher Education, Nicholls State University, August 2016 - Present.

Responsibilities include: Teaching undergraduate and graduate courses listed below, advising students, preparing accreditation visit reports, coordinating placement at local schools for teacher education candidates, serve on department, college, and university committees.

Areas of Teaching:

EDUC 251: Introduction to Technology Integration for Teachers
EDUC 339: Elementary Methods in Art, Music, and Physical Education
EDTL 501: Design and Development of Multimedia Instructional Units

PUBLICATIONS

Junot, M., Breaud, M., Dempster, S. (In progress) "Perceptions of university faculty on the instructional and social strengths and challenges of students with autism (ASD) in college courses.

Vavasseur, C. B., Crochet, F., & Dempster, S., (2016). The impact of digitally enhanced Reading interventions on struggling readers and teacher education candidates. Open Journal of Social Sciences, 4(11), 97.

Vavasseur, C., Dempster, S., & Claytor, C. (2015). ITPD3: Instructional Technology Professional Development 3. Article published in EdTekHub by ISTE.

PRESENTATIONS AT PROFESSIONAL MEETINGS

Broussard, J., Dempster, S., Hebert, D., Logan, S., Peavy, E., Pray, J., Vavasseur, C. (2019) How Louisiana is preparing the next generation of technology coordinators. Presentation at the annual conference for the International Society for Technology in Education. June 2019

Vavasseur, C, Dempster, S. & Stein, M. (2017). Instructional technology PD personalized. Accepted presentation at the annual conference for the International Society for Technology Educators. June 2017

Rice, M, Dempster, S., Vermilio, H., Vavasseur, C. & LaPrairie,K. Designing online education: It's more than simply putting a face-to-face course online. Accepted presentation at the annual conference for the Society for Information Technology and Teacher Education. March 2017.

Vavasseur, C. & Dempster, S. (2016) ITPD3 in Action: Instructional technology professional development. Accepted presentation at the annual conference for the International Society for Technology Educators. June 2016.

Vavasseur, C., Crochet, F. & Dempster, S. (2016). Results of CLASS: Clever literacy apps for students success. Accepted research paper presentation at the annual conference for the International Society for Technology Educators. June 2016.