COLLABORATIVE COMMUNICATION
IN WORK BASED LEARNING PROGRAMS

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Stephen Allen Wagner
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Abstract

This basic qualitative study, using interviews and document analysis, examined reflections from a Work Based Learning (WBL) program to understand how utilizing digital collaborative communication tools influence the educational experience. The Community of Inquiry (CoI) framework was used as a theoretical frame promoting the examination of the three elements including: social reflection (communication), cognitive exploration of work-related curriculum in a real-world environment (work based learning), and teaching presence within technological structure and process (facilitating collaborative technologies). The central research question guiding this study was: What are the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ educational experience? Findings of this study demonstrate that digital communication skills: Promote ongoing student portfolio creation that aligns with work force skills; Amplify student sharing and discussion capabilities; Require patience to provided beneficial results; Increase efficiency and convenience; Improve the ability to regularly update learning material and provide continuous access; and Increase the availability of a student safety net for those struggling or adapting to the new digital skills. Implications for practice and future research are discussed.

Keywords: work based learning, Community of Inquiry framework, communication, collaboration technology integration
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Chapter One: Introduction

The digital technologies of the 21st century are revolutionizing education with increased access to information in new and faster ways, with more emphasis on social interactions in learning where collaboration and communication play important features of educational experiences. Today’s teachers are faced with increasing expectations that they respond to the influence of multiple digital technologies not only to integrate them in their instruction but also to examine the impact of these capabilities on the curriculum and the pedagogies of this digital age.

(Niess & Gillow-Wiles, 2015, p. xxv).

Statement of the Problem

The emphasis of connecting education to career learning has grown dramatically in recent years. Work Based Learning (WBL) programs have prospered due to this growth in Career Technology Education (CTE) especially at the K-12 level (Gordon, 2014; Bailey, Hughes, & Moore, 2004). Students in these programs connect classroom learning to actual real-world working environments. On an economic scale, it is noted that students who participate successfully in these types of programs have greater “potential wage earnings by 18 percent” (Voytek & Zimmermann, 2015, p. 20). With increases in technology, students in WBL programs are able to communicate with work based mentors, coordinators, and teachers in new ways. One particular increasing element in WBL programs is to create a social learning environment that assists students in reflective practices within the building of a portfolio. As these networks and portfolios move online, it is vital that these digital communication practices are beneficial to the overall collaborative communication in WBL.

The process of searching, evaluating, selecting, and sharing is now a vital practice to make sure that these digital tools are effective (Raisinghani, 2016). Evidence shows that “as
these digital media and new information and communication technologies become increasingly ubiquitous in our daily life practices, it behooves us to closely examine both the pitfalls and possibilities that such technologies afford” (Black, 2016, pp. 1-2). If digital communication tools have become closely intertwined in the WBL program, and if coordinators of the program are responsible for the increased selection of such tools, then more must be known about the role and integration of such tools. Therefore the purpose of this qualitative study was to explore WBL coordinator perceptions relative to the overall experience, utilizing the Community of Inquiry (CoI) framework, to better plan and integrate the use of collaborative technologies to improve learning. Work Based Learning coordinator perceptions explored in this qualitative study will include the use of digital collaborative communication to support communication, learning, and teaching within a WBL program.

**Justification for the Research Problem**

Research in the area of using technology tools in WBL has concentrated primarily in two areas. The first area of focus includes the technology tools that are used consisting of emails, distance learning programs including Google Open Online Education and Blackboard Learn, mobile phone, personal digital assistant (PDAs), and other tools. Research by Huang, Liao, Huang, and Chen (2014) supports the additions of the mobile learning devices to “learning activities based on real situations” (p. 128). The digital age has created these products listed above which can be used in whole or part to support the educational goals of those involved in work training outside the school walls.

The second area of focus when it comes to communication in WBL is the importance of reflection and the social learning that is involved. Cook and Pachler (2012) note “social networks and associated technologies have continued to gain importance in people’s everyday lifeworlds”
This relationship is now associated with the education world especially in early career learning. Studies attentive to the relationships of how individuals work together to learn in an interactive environment has created a paradigm shift in career education.

Previous research on this topic has explored both the tools of communication technology and the social aspects of work based learning beyond face-to-face. Unfortunately, minimal attention has been focused on how the digital communication tools and social aspects actually benefit the educational experience. Furthermore, the processes and collaborative communication aspects that can be utilized to improve the learning process in WBL are often overlooked. It is noted by Dyrud (2012) that “students and faculty immersion in what are becoming traditional social networks – Facebook, Twitter, LinkedIn – as well as more adventuresome venues – podcasting, microblogging, wikis, RSS syndications – are beginning to change the landscape of education” (p. 61). However with all these medium changes, it is crucial to see if digital collaboration is valuable and what processes can work best when integrating within the WBL programs. It is hoped that by exploring the perceptions of WBL coordinators in regards to the educational experience, the role and integration of digital collaborative communication tools can be further understood.

The focus of this study on work based learning collaborative communication benefits those primarily in the field of CTE. Findings will assist high schools policy makers and educators on best practices in selecting, implementing and using digital communication tools to enhance the educational experience. It is hoped that WBL coordinators will assist in identifying the role of digital collaborative communication tools to improve the reflective learning process.
Significance of Research Problem

Today’s attention on career training has increased in importance with the number of vital employees needed to replace those retiring. Furthermore, it is essential to train students to be successful in terms of collaboration and communication for the careers of the future in new industries emerging (Partnership for 21st Century Skills, 2004). With the advancement of technology and the skill-gap that exists, WBL has taken center stage. The “increasing interest among educators, employers, and community leaders in implementing work based learning into schools as a means of enriching the academic curriculum with in-demand career skills development” is creating a need to make sure programs are utilized efficiently (Jacobson, 2015, p. 15). Alfeld (2015) notes that since “the School-to-Work Opportunities Act ended in the early 2000s, there has been little federal investment in WBL” (p. 24). Thus, it has become crucial that these programs’ processes are more resourceful due to inadequate funding to maintain.

Due to the efficiency needed in WBL programs, it is vital that each process contained in the program is analyzed. All stakeholders involved in this area will profit by determining the best practices in the use of collaborative communication. As students reflect and share their experiences in the field, each will learn from one another to improve their personal skill sets. The use of technology to create this collaborative communication can provide another avenue of reflection and learning when used properly. Sun, Looi, & Xie (2014) note “that teacher attitudes and beliefs towards technology and their technological knowledge and skill predict their technology use” (p. 400). By making sure that processes using collaborative communication tools align with WBL coordinator attitudes in the WBL program, there is a greater possibility of success.
On a local level, further research in this area will help sub-groups in the student population that are served by WBL. Students who are English as a Second Language (ESL), minority, Talented and Gifted (TAG) and others will be supported as they are able to share learning experiences with others in a variety of career fields. Students who are ESL will be able to further advance fluency in the English language and share connections to culture through reflection practices. Talented and Gifted students will have the ability to concentrate interest and closely match individual learning styles. Other groups such as Exceptional Children/Special Ed, can develop further career skills in terms of individual needs and progression goals.

Students are no longer locked into only learning about one particular job. The WBL program supports the opportunity to explore different careers that are found within the chosen pathway. Furthermore, it is hope that by using collaborative technologies, students can learn from other shared information that may be in different job functions. Communication technologies provide a means to share this information and make it readily available to those in other worksites. As described by Holzer and Lerman (2014), WBL programs “can contribute to full employment directly by stimulating the growth of jobs for youth, the demographic with the highest unemployment rates” (p. 20). By addressing career issues at a local level early within the WBL program, students are more likely to advance. This advancement across the nation will increase competitiveness, production, and labor demand over time (pp. 20-21). Educators in this area of career training must focus much of their curriculum to help students be “fit for living in society” (Clausen, 1968, p. 21). Leaders must prepare career plans to match the needs of those trying to attain career skills.
Positionality Statement

Experienced as both a WBL advisor and a product of a similar internship/apprenticeship program, these events have influenced the choice in research momentously. Foote and Bartell (2011) convey that personal experiences “influence what researchers may bring to research encounters” including choice of process and outcomes (p. 46). In practice, the researcher has assisted in the operation processes and developed WBL programs. Implementing more of an electronic medium surrounding the program, the researcher witnessed collaboration grow to a place in which students can share understandings with experts in the field. This partnership has expanded the reflection and connection beyond experiences as an apprentice participant. This influence has encouraged the researcher to explore the processes that make using electronic collaboration more valuable.

As background, the researcher grew up in a small town in Georgia that had few opportunities for moving into the workforce once graduated from high school. There were three major routes to make it into the workplace which included the bank, hospital, or military. Except for the last one leading out of town, these opportunities usually had many candidates applying for the same job title. One way to get into one of these scarce positions include an internship with the local high school. Taking advantage of this, the researcher applied for the internship program landing a spot in environmental services. Moving through the program, the researcher realized that much was left to the hospital for training and little guidance was offered from the school. Thankfully the researcher was provided a good manager that encouraged growth and further development. Eventually, the researcher was able to acquire the skills through hospital preparation to begin moving into information technology and save enough money to start at the local junior college.
Starting at the local junior college, the researcher visited the job and career center. At this time, travel was becoming an issue with the commute between work and school. Needless to say, when an apprenticeship opportunity opened on campus to work in the information technology and media services department it was a perfect fit. This apprenticeship through the junior college was much more focused and helpful when it came to selecting correlating classes and building skill. Furthermore, it provided an opportunity for the researcher to visit some other colleges in the city of Atlanta.

After several years at the junior college completing much of the general courses, the researcher transferred to an engineering school in Atlanta. Here the researcher immediately applied for an internship at a multimedia company that provided digital editing and information technology services. Eventually, the internship became more of a platform where the researcher began teaching and doing training sessions for clients. The researcher eventually completed both bachelors and masters in the engineering training field. Throughout the journey, the researcher intertwined internships to help advance career opportunities.

After graduating from college, the researcher was hired just north of Atlanta as a county contractor to put in engineering labs and train teachers to use the facilities to its fullest potential. During this phase, the researcher assisted teachers that were completing degrees and working on student teaching assignments. This was an excellent opportunity for the processes to start becoming full circle. Several years later, the researcher moved into an engineering teaching position at a local high school assisting students into internship positions. The researcher during this time period returned to college to work on an education specialist degree in Occupational Studies. This opportunity fortified the researcher in the skills to assist students in finding and starting a career that would be meaningful.
Working in the field of education, it is always important to keep learning and acquiring new skills to help motivate students. In continuing this tradition, the researcher applied for the education doctoral program at Northeastern University. The researcher during this time period has been focused specifically on internship and apprenticeship training otherwise known as WBL. Throughout the journey, each course has directly applied to the goal of the researcher. Furthermore, the courses in the program laid the foundation for this research and solidified the skills needed to complete the process.

In practice, the researcher is clearly a proponent of the WBL program once having been a participant and now an advisor. On a daily basis, the researcher works closely with the coordinator providing the WBL program to those interested in a career in engineering or architecture. Within the media industry, Herbert (2014) notes “reflexive-ethnographic analyses” include “how these people thought about themselves, their work, their communities and their participation” (p. 47). Due to the fact that this research ties in closely with the media industry using online communications, the researcher too must reflect on connections and those participating in the study. For example, the researcher has assisted the current WBL program to include this format in learning. However, the researcher must understand that not all WBL programs may benefit from this format. Also, some programs might be much more advanced, making it crucial that the overall process is explored. The researcher also notes that the information attained from those participating can provide a plethora of valuable information that can benefit other programs.

Founded on experiences as a CTE educator and WBL advisor, the researcher has observed that digital communication tools are becoming more readily available and today’s high school WBL students are more involved in a social learning environment that assists students in
reflective learning practices including the building of a work-portfolio. However, it is often
difficult for WBL coordinators to determine which digital communication tool will serve the
overall educational experience.

The activity of a research study is often described as a “process, not just a product”
(England, 1994, p. 82). For the researcher, this journey both in personal and professional life has
been part of the progression towards research. The passion in WBL has primarily ignited the
drive to push through the obstacles related to examination of the topic. As a former student in a
similar program, the researcher understands the accomplishments that can be made in a
successful program. In professional terms, the researcher hopes that WBL training programs can
become as prosperous as possible to help the student reach those accomplishments. It is hoped
that this research study plays a role in helping other programs provide a path towards a
meaningful career for students.

Research Questions

The fundamental focus of this study centers on the fact that more WBL programs are
using technological tools to communicate. As with all educational programs, it is important to
make sure that the tools are being utilized appropriately. Collaborative learning is crucial for
WBL programs to be effective. As WBL coordinators move programs online using collaborative
tools, it is vital to discover best practices to increase potential success. Therefore the central
research question guiding this study was: What are the perceptions of high school work based
learning coordinators about digital collaborative communication tools in enhancing students’
educational experience?

In order to inform this overarching question, the following sub-questions were asked.
1. How do WBL coordinators use digital collaborative communication tools to support communication?

2. How do WBL coordinators use digital collaborative communication tools to support learning?

3. How do WBL coordinators use digital collaborative communication tools to support teaching?

The three sub questions provided a way to coordinate the overall study moving towards the Central Question. The first and second sub questions explored the role and integration of digital collaboration communication tools. The first discovered the role of collaborative tools in regards to the support of communication within the WBL program. To make the overall study valuable, it is significant to find out how these collaborative communication tools promote a sharing environment. Continuing in this manner, question two focused on the integration and support of learning that digital collaborative communication tools provide for the high school WBL program learning experience.

The third question allowed the researcher to discover the structure and process in which digital tools assist in teaching presence. The focus included the technology tools that are used consisting of emails, distance learning programs, mobile phone, apps, and other packages. Due to the number of tools possibly used in WBL programs found in initial research, it was imperative to concentrate efforts on the primary ones generated during the interview process.

**Theoretical Framework**

The Community of Inquiry (CoI) framework will be used as a theoretical frame to guide this study. Work based learning does not occur in a vacuum and requires a community in which a student can participate and connect educational principles. In a study that explored both the tools
of communication technology and the social aspects of work based learning beyond face-to-face, it will be important to make sure that it benefits the educational experience. The CoI framework promotes the examination of the three elements including: social reflection (communication), cognitive exploration of work-related curriculum in a real-world environment (work based learning), and teaching presence within technological structure and process (facilitating collaborative technologies).

The Community of Inquiry (CoI) framework is directly formed from the times of John Dewey. The certainty that education must connect directly to the individual within society is prevalent in relation to experiences (Dewey, 1959). In simpler terms, each student in their
Figure 1. Community of Inquiry Connections. Reprinted from Garrison, Anderson, & Archer (2000).
personal environment must feel a connection to the subject. Adding to this belief, Lipman (1991) continued that reflection should take place socially, which clearly ties the CoI framework to communications. As communication occurs within a student’s societal environment, educational connections can occur in context.

Garrison, Anderson, and Archer (2000) clearly identified the components of the CoI framework in context of education and internet studies. As the authors adapted the model to online higher education, connections become quite relevant in the overall education experience. Figure 1, reprinted from Garrison, Anderson, & Archer (2000), provides a view of the overall significance of the CoI framework in regards to the study of communication technologies on work based learning.

In examining Figure 1, (Garrison et al., 2000) the overall educational experience in work based learning is centered on the social, cognitive, and teaching presence. Social is concerned with a communication dialogue that occurs between all stakeholders in the program including WBL coordinators, students, teachers, parents, and worksite managers. Cognitive supports the exploration of learning in work based learning by connecting curriculum and ideas. Lastly, the teaching presence facilitates these occurrences through instructional technologies and guidance. The educational experience is all interconnected by climate, content, and supporting discourse which is all tie into student, WBL coordinator, and job site environmental interactions.

Historically, the CoI framework has been time-tested in numerous research projects with slight modifications along the way. These slight modifications have kept the framework relevant in understanding the community aspects of an educational experience. Modified from Dewey’s belief that learning happens both contextually and socially, the CoI framework became a tool used to analyze online or e-learning in recent times. Within the modernization of CoI, the
“social presence is therefore viewed as directly impacting the development of community and collaboration in online courses” (Swan, Garrison, & Richardson, 2009, p. 9). The online connection of the CoI framework has propelled it forward from the early 1990’s when educators were first beginning to use technology in online discussions.

Adaptations made to the CoI framework are attributed to scholars which applied it to various studies in the field. More recently, as noted by Walther (1994) the CoI framework has been connected to online learning and the social atmosphere which is virtually created. In this illustrated interaction research, the computer becomes the environment in which communication takes place. Thus, much of the scholars that have utilized the CoI framework have come from the communication side of researchers. Anderson, Liam, Garrison & Archer (2001), provided a large jump when it comes to connecting the CoI framework to education and communication environment. Within that jump, the “dimensions of teaching presence and their roles in the dynamics of a collaborative constructive educational experience” are brought to the forefront of the framework (Swan et al., 2009, p. 13).

In researching the perceptions of digital collaboration tools in WBL programs, other theoretical frameworks could relate. One theoretical framework that was analyzed intensely before choosing was Integrated Curriculum Theory (ICT). The ICT framework is often used in vocational education to look at the advantages a program would have when it comes to implementing a technology platform in work based learning. Integrated curriculum’s significance is tied to the definitions including: “a combination of subjects, an emphasis on projects, sources that go beyond textbooks, relationships among concepts, thematic units as organization principles, flexible schedules, (and) flexible student groupings.” (Quinn, 2013, p. 14).
Although it provides strong correlation to vocational education in the realm of education, ICT has major gaps especially when it comes to communication. Beane (1997) created a concept map that pulls curriculum themes in four different directions including: self/personal concerns, social/world concerns, knowledge, and concepts. Quinn (2013) notes how this framework transcends the overall curriculum in relation to both the student and institutions. Recent improvements to ICT seem to be mostly motivated by the increase in science, technology, mathematics, and engineering or STEM programs. In fact, Fogerty (1991) conveyed ten levels of curriculum integration which provided a description and graphic, advantage, and disadvantages. Unfortunately, in researching perceptions of collaborative learning, ICT does not provide a dynamic that applies to the digital collaborative communication realm.

The CoI framework choice comes from the strength of focus on community and electronic communications. In fact, the framework can directly connect the three elements of technology communication, collaboration, and WBL/vocational content learning within practical application. A major strength is that this framework was further designed to develop and assess online learning environments. Connecting the CoI framework to examine the WBL digital communication realm makes it a wise choice as it permits the researcher to explore in context. More importantly, the findings will include the medium, social, and educational aspects of the WBL program in an action setting. The overall educational experience as described by Garrison et al. (2000) can provide insight into the functioning and processes that occur in a real-world context.

The CoI framework does display some minor weaknesses in researching electronic communication in high school WBL programs. The CoI framework has been adapted to study online courses in particular. Work based learning programs typically are designed to be more
hybrid in being able to meet both in-person and online. In-person includes both the work place environment (supervisor) and school (coordinator) that is providing the program. In using CoI, some research data found may not exactly fit into the three framework categories being analyzed due to the hybrid nature of WBL. Although this non-fitting data can be problematic, it does provide further opportunities for research at a later time. There is a bit of vagueness when it comes to the framework in some aspects of education needs, mainly due to the connectedness of communication technology and collaboration. Furthermore, the CoI framework also tends to lean towards higher online education which will need to be realized. Nevertheless, the choice of the CoI framework should work well when exploring the use of digital collaboration communication tools in regards to the educational experience in high school WBL programs.

The CoI framework assisted in defining and shaping the focus of the overall study in direct correlation to the research questions. RQ: What are the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ educational experience? The fundamental motivation of this study centers on the fact that more WBL programs are using technological tools to communicate. As with all educational programs, it is imperative that the tools being utilize for collaborative learning is supportive for the WBL program. As students, work based coordinators, worksite mentors, and area teachers move to online collaborative tools, it is imperative to discover best practices to increase potential success. Thus, by framing it within CoI, the overall educational experience can be examined in relation to the communication medium.

The three sub questions provided a way to coordinate the overall study moving towards the Central Question. The first and second sub questions explored the role and integration of digital collaboration communication tools. The first question allowed the researcher to identify
how the digital collaboration tools support communication. The second discovered how digital
collaborative communication tools are integrated into the WBL program and how the tools
support learning. The social/cognitive connections made in connection with these question
support the CoI framework.

Centering on the CoI framework in relation to educational experiences, it is significant to
find out how these collaborative communication tools support a teaching presence. The third
question focused on the teaching support that digital collaborative communication tools provide
for the high school WBL program. In alignment with the CoI framework, this would fall under
teaching structures and process in place. The focus includes the digital collaborative
communication tools that are available consisting of emails, distance learning programs, mobile
phone, apps, and other packages.

Students in WBL programs are directly connected to experiences that are formed in the
realm of society. As experiences build, students feel a closer connection to the subject being
learned. The CoI framework clearly ties the social reflection performed in WBL programs and
the communication mediums in practice. Educational connections are shared while occurring in
context within a student’s societal environment. The three elements of the CoI framework
examine social reflection (communication), cognitive exploration of work-related curriculum in
a real-world environment (work based learning), and teaching presence within technological
structure and process (facilitating collaborative technologies). The strength of this framework
and its linking of technologies and communication within real-world context makes the CoI
framework an obvious choice.

The problem of practice and research questions are infused with a real-world connection
focusing on the educational experience. The CoI framework promotes an in-depth map that can
be used to research and explore the overall subject. The framework promotes further critical analysis of literature and research that fall within the lines of CoI producing a more expressive study. Work based learning is a social event, making content, climate, and discourse a critical part in observing the educational experiences. The CoI frameworks offers avenues for this to be taken into account in relation to the overall importance of the study providing an excellent avenue to explore the overall WBL educational experience.
Chapter Two: Literature Review

Introduction

Career training has never been more necessary as employers are looking for well-skilled employees to fill job positions. Career and Technology Education (CTE) programs around the United States are working diligently to make sure that a qualified labor force exists to fill those vacancies. One element of the CTE program to note is Work Based Learning (WBL). Work Based Learning programs assist students in gaining workplace experience. Today, WBL use a wide variety of digital collaborative communication tools to increase student participation. It is important to note that with all the tools, it is crucial that best practices are in place to provide overall success in programs. This literature review examines the areas of career and technology education, work based learning, and digital collaborative communication tools to allow the researcher to explore an in-depth study on best practices.

Career and Technology Education

The primary goal of CTE is to skill train students for the workforce. It is crucial that educators in CTE arrange the curriculum so that students can fit into the workforce and be an active member of society (Clausen, 1968, p. 20-21). Many subjects including Health Occupations, Business, Engineering, Architecture and others make up the fields of study for career training. For institutions that have WBL, the courses in a specific subject area will culminate into a workplace experience connected to the school. The two primary WBL opportunities in high schools include internships and apprenticeships (Senderoff, 2013). The internship is usually short term and non/low-paid while the apprenticeship is for a longer term, paid, and often leads to a job. Sometimes WBL programs will have a combination that has the
right mixture for the individual students (Wilson & Pinckney, 2015). For example, some students will start off with unpaid internships and then move into a paid apprenticeship position.

Career and Technical Education programs throughout the country strive to offer students curriculum that will provide more opportunity for career achievement. Many of these programs exist in secondary schools from local school districts, private schools, to charter schools. Programs are known to transfer credits from the high school into technical schools or colleges. Sometimes special schools are setup around the CTE program to offer in-depth opportunities. One example includes York County School of Technology where some students travel many miles to attend (Wright, Thomas & Rogers, 2014, p. 37). These schools can draw upon students that want to focus on a particular career and be provided a direct pathway.

Dedicated schools in CTE often operate much in the same way as typical district schools. However, the primary emphasis is on skill training. Wright, Thomas and Rogers (2014) express that CTE schools like York “are working toward each student having the ability to choose any option upon graduating, i.e., going into the workforce, attending a two- or four-year postsecondary institution or enlisting in the military” (pp. 37-38). Although the dedicated school is more in direct line of skill training, the goal of general studies principles are still in place similar to that at many public and private schools that offer CTE. In fact, as CTE schools create and encourage WBL programs, the lines start to blur when it comes to preparation.

Part of the blending occurs when education and industry work with one another to achieve a common goal. Both parties would like students that are better skilled trained for industry and achieve greater knowledge when it comes to overall general studies. Thus, by both education and industry working together, much more can be achieved than when working alone. Whyte (2006) notes that “The National Center for Construction Education and Research
(NCCER), headquartered in Gainesville, FL, was created specifically to address the workforce shortage” primarily in the areas of industry and construction (p. 19). The group worked together with local schools to create a track for students to enter surrounding workplaces. After many meetings and trial and errors, the group has become an integral part of the CTE system. The organization “allocate(s) an array of resources and efforts into improving the image of the construction industry by creating awareness of career opportunities through print ad campaigns, Web sites, videos, and an annual Careers in Construction Week campaign” benefiting the school, industry, and student.

Science, Technology, Engineering and Mathematics education (STEM) has continued to push the boundaries of typical secondary education. High schools across the country have jumped on the STEM curriculum as the need for job recovery exists greatly in certain regions (Atkinson & Mayo, 2010). In fact, schools are often blending this with already established CTE programs to use what is already in place to grow to the next level. Ellner (2015) summaries that “our nation needs more young people who are skilled in science, technology, engineering and math to create a strong workforce, as these disciplines are responsible for many innovations that move our country forwards in today’s global economy” (p. 44). As noted by Atkinson & Mayo (2010) those communities that jump onto the STEM concept in connection with CTE are being re-stimulated economically as businesses find higher skilled individuals.

The recent alignment between CTE and STEM have created an influx of applicants into WBL programs in a majority of student populations (Tsui, 2007). Students appear to have more desire to train in actual workplace settings showing skills learned from the classroom. Ellner (2015) illustrates, “the beauty of CTE lies in the definition of STEM as not just science, technology, engineering or math, but as the integration of two or more of these disciplines within
a context that ignites the passion of an individual student” (p. 46). Students are now able to create a vision, learn, and put to practice individual career paths.

The number of career pathways for students to enter grows every year with the alignment of the CTE and STEM since student tracking in the area began (Hull, 2005). Blosveren and Voytek (2015) note “The National Career Clusters Framework provides a vital structure for organizing and delivering quality CTE programs through learning and comprehensive programs of study” (p. 20). Centered in this framework are strong WBL programs that provide students the opportunity to engage with local companies. Showing this growth, “the 16 Career Clusters and the corresponding 79 Career Pathways address the full world of work, demonstrating that CTE can prepare students for any industry or career (Blosveren & Voytek, 2015, pp. 20-21). At this point, there is very little room for students to slip through the cracks due to the lack of career path offerings.

The blending of curriculum continues to grow as teachers in different departments work together for the overall benefit of the student as a whole (Konorski, 1968). In connection to WBL coordinators, this provides an excellent opportunity to also expand the knowledge base offered to students during reflective practices. Some school districts are having CTE teachers work with the math, science, and other specialized teachers directly so that teacher strength can be utilized. School districts like Washington County, Utah implemented a similar program where student projects “are interconnected with math and science concepts that suddenly make more sense to students who previously struggled to learn them in isolation through a textbook in a core math or science classroom” (Farmer, 2015, p. 39). Thus, the students are becoming more closely connected to the CTE program while making greater strides at core curriculum areas. On point, Yoruk, Morgil, and Secken (2009) suggest that continuing knowledge gains in these areas
can be of great assistance in career planning especially when student interest and real life training are experienced (p. 74).

The Association for Career and Technical Education (ACTE) has a yearly conference that joins CTE teachers from all around the globe including teachers in WBL. At the conference, ideas and solutions on curriculum and growth are shared enthusiastically among members (Lynch, 2000). Included at the conference is a CareerTech Expo where CTE training equipment and learning materials are displayed. Smaller programs are often encouraged by larger offering similar programs resulting in increased sharing and blending of information. Liccion (2015) expressed that “hands-down, the biggest benefit offered to us was the opportunity to network, which started at registration and continued up to the moment we left” increasing the sharing of ideas (p. 40). Often times, these relationships continue propelling programs to the next level. The sharing often times goes beyond the equipment and focuses on the needs of the student and how curriculum can be improved including within WBL programs.

High school students benefit greatly from the shared curriculum and the ongoing building of a program for the modern era (Lynch, 2000). Nevertheless, the essential goal of CTE is to prepare students for actual workplace attainment. True establishment of a CTE program centers on connecting and partnering with employers. Jackson (2014) describes that corporate partnerships certify that learners “receive education that is on the cutting edge of their fields of study” (p. 17). These ongoing partnerships can lead into the creation of meaningful WBL programs.

**Work Based Learning**

CTE provides students with workplace skills using a learning-by-doing method. Learning in the workplace is nothing new as it has been “an integral part of the education system
in many industrialized countries” (Alfeld, 2015, p. 24). It is hoped that students in the workplace will be able to use and develop further skills that were learned in the classroom. Currently, job markets are difficult to enter for individuals that lack training. As noted by Jacobson (2015), employers and community leaders desire work based learning in schools (p. 15). Communities have found that the more successful these programs are at producing well-qualified candidates, the more interest companies have in moving to that area.

Work Based Learning programs are very dynamic in nature conforming to the localities in which practiced. Voytek and Zimmermann (2015) state, programs “can come in many shapes and sizes” (p. 20). In recognizing this, the focus is still the same across the board in the fact that students solidify the knowledge gained in the classroom. Alfred (2015) continues, “WBL is an important way for students to learn about whether they are interested in and good at different types of career areas, as well as learning technical, academic, and employability skills” (p. 24). On the flip side, students can also have the opportunity to find out if a job will not be a good fit for the future.

Historically, WBL programs have been around for many years. Jacobson (2015) notes that “work-based learning is one of the oldest forms of learning” (p. 16). At first, much of the learning focused around agriculture training and eventually moved to apprenticeships. The more industrialized the nation, the more likely it would resemble today’s programs. Today’s interest in “intensive programs like internships and apprenticeships, can also afford employers the opportunity to directly recruit the most talented potential employees before they ever enter the labor market” (Voytek & Zimmermann, 2015, p. 20). Mirroring the past, employers are looking for the best candidates that will be the correct fit for whatever the labor or location.
The progress of WBL programs in the United States has been sporadic as the needs of the country and educational philosophy continued ongoing change (Watson, 1995). Many of the fluctuations were based on the needs of the society at different times in history. Perhaps the most influential time period for WBL was when the “new ideology proposing the supremacy of vocational skills for gainful employment and for supporting the needs of the expanding economy” took center stage (Jacobson, 2015, p. 16). The movement in this direction opened more opportunities for students to learn by doing in the workplace.

Industrial progress in the country motivated leaders to push for vocational skill level improvement in schools. Several laws came to fruition due to the needs of employers across the nation. According to Jacobson (2015), the Smith-Hughes Act of 1917 propelled these philosophies and included a vocational training track. Unfortunately, the “technical skills-heavy vocational training” did not concentrate at all on the individual (p. 16). To correct this issue and make it more appropriate for the student, WBL programs have tended to take more of a holistic approach at making sure that stronger connections are formed.

Individual approaches encourage a direct connection to the knowledge learned in the workplace. Holzer and Lerman (2014) express that this direct connection to the individual can be beneficial by expanding apprenticeships (p. 18). Areas that have had economic issues can turn the environment around by using more learn-on-the-job programs. In fact, by meeting the needs of those students in the local community, employers also gain a larger work pool that can be pulled upon at a later date.

Encouraging the individual approach, policymakers focused on connections between both the needs and wants of students. As noted by Alfeld (2015), the School-to-Work Opportunities Act was pivotal in the connection which concluded in early 2000s. The recession has stimulated
this idea again as the “search for ways to help prepare students for college and careers” is vital (p. 24). The literature in WBL supports the fact that when policymakers consider both the workplace and individual considerations the alignment is improved.

Officials working on this instructional strategy at the state level and local level provide a closer link to this alignment (Watson, 1995). In fact, many gains are made the closer the developments of regulations are to the student. Voytek and Zimmermann (2015) express that “work-based learning is a local endeavor, with most programs and relationships forged between individual schools and companies” (p. 20). Although, much funding comes from the federal level involving the Carl D. Perkins Career and Technical Education Act of 2006, several states have tacked on more to stimulate access to programs (p. 22). Many local jurisdictions, including both large and small cities, have worked to improve access throughout the country.

Highlights of state and local authorities include West Virginia’s program named Simulated Workplaces which was developed to “help students apply their academic, technical, and employability skills by bringing the environment of a workplace inside the classroom and grounding student learning in a real-world context” (Voytek & Zimmermann, 2015, p. 22). The authors note that partnership of this program with local employers promoted ongoing participation in WBL. As programs continue to grow, a connection has been made to local colleges and continuing education grants from those schools.

According to research, other states and large cities are following this approach to start early. New York and New Jersey are creating “incentive wars” to bring in companies including programs to get students officially trained (Gottlieb, 2013, p. 18). In fact, many of the closer cities are starting to share more program information. Voytek and Zimmermann (2015) state that “Maryland issues an annual report which shares information” with other communities displaying
connections of practice (pp. 22-23). The sharing of information certainly benefits startup programs in other areas.

The literature maintains that WBL program success “depend(s) on the quality of the program” (Alfeld, 2015, p. 26). With the ongoing sharing of information among programs, including over state lines, the increase in overall quality has increased. Alfeld (2015) provides four factors that display high-quality including that programs must be structured and integrated in school curriculum demonstrating ongoing learning, opportunities available in meaningful experiences in which they can reflect, share learning goals, and must have links to market and needs of employers (p. 26). In this ongoing theme of high-quality, ongoing communication it is necessary to set goals and provide learning experiences that matter.

Although models can vary drastically, it is important to note that these programs are more than just an entry level job. Holzer and Lerman (2014) express that WBL is more “especially in terms of making a successful transition to adulthood” (p. 18). Perhaps this is why it is stressed that “good WBL experience should provide more than just a job or credits for the student and more than just “cheap labor” for the employer” (Alfred, 2015, pp. 26-27). To move students through this transition, it requires quite a bit of reflection and growth as an individual. By the employer, student, and school coordinator having a clear understanding and communication of goals, the program should move to a higher realization of linking.

The fluctuations in the economy have had an influence on WBL programs throughout the United States. Experience has shown that when the economy is going well, companies want to bring on as many students as possible. However, when the economy is not, programs in schools suffer as finding placement becomes extremely difficult. Unfortunately, many areas are finding that when the latter occurs, a decrease in youth skills occurs. Thus it is crucial that stakeholders
understand the “indirect contribution to full employment comes from enhancing job skills directly relevant to productivity, thereby increasing competitiveness, production, and labor demand in the United States” (Holzer & Lerman, 2014, p. 20).

WBL is surely to get much more exciting in the near future as technology continues to press forward. Labor demands are certainly going to shift in the world. To keep up with these shifts WBL programs must continue to adapt and reevaluate. Industry, institutions, and students must find the WBL programs that meet the desired goals to remain relevant. One example of this modification is currently in manufacturing and the increase elements of automation. This change in technology will certainly influence the way training takes place in manufacturing as training will be centered on programing of robots rather than doing the work manually. Pinto (2014) explains that manufacturing is now moving into a new phase where people will primarily be there to design, program, and service robots (pp. 18-19). WBL programs must be prepared to keep up with these demands and provide instructional avenues in the workplace where students can receive experience. It will certainly be vital to keep open the line of communication in all applicable fields so that WBL programs remain current and relevant.

**Collaborative Communication Technology**

Education is moving more and more towards the online world. WBL programs are following closely behind with the need of collaborative communication. The connection between the workplace, student, and school mentor has grown much closer due to this movement online. The sharing of information among programs provide a cornerstone to build upon when it comes to the all the stakeholders. Students are now capable of sharing knowledge and reflections. Workplace advisors are able to provide feedback and growth understanding for
students. School WBL coordinators are able to bring the two groups together and the learning goals of the institution.

The movement to web-based learning in schools has created a whole new model to work with when it comes to school environments. Educators and students often act much differently as additional layers of capabilities are added. Sun, Looi and Xie (2014) note that “teacher attitudes and beliefs towards technology” often influence use (p. 400). With that in mind, teachers absolutely must have some training to create a curriculum that meets the needs of both the district and students. Understanding these needs are very beneficial to all involved as there must be a level of comfort for WBL coordinators to implement online communication practices.

Along with the comfort, coordinators must also move to more modern practices of technology implementation. Teachers having “traditional pedagogical beliefs” are often less likely to move to this next level (Sun, Looi & Xie, 2014, p. 400). With this understanding, the training in implementation becomes much more crucial. Furthermore, if this is happening on the educator side, these feelings might also be occurring with the student or workplace mentor. Although students today are often more comfortable with the use of online communication tools, it will be critical that the educator training include some facet of assisting both the students and employers.

The basis of using online communication tools in the WBL programs is to improve learning results. Yueh-Min, Yi-Wen, Shu-Hsien, and Hsin-Chin (2014) express that much of this improvement comes from a “jigsaw-based cooperative learning” (p. 138). Today, there are many tools and approaches that assist with collaborative communication. The authors note some online learning platform approaches including: e-learning which is wired and non-mobile, m-learning which is wireless using mobile devices, and u-learning which is completely flexible to
the needs of learner (Yueh-Min, Yi-Wen, Shu-Hsien, & Hsin-Chin, 2014). Furthermore, each approach brings up a new category of tools. The tools, for example could be software driven or just the simple use of texting through a mobile device.

With the tools of collaborative communication being numerous, it is crucial that ongoing training occur so that proper practices are in place. Management of these numerous tools will be an ongoing effort for WBL coordinators who put it in practice. Manpower, time, and organization are going to be crucial in helping these tools become functional as stated in much of the literature dealing with education communication tools. With this being the situation, more training focus will be on the WBL coordinators and mentors putting this in place.

The flow into using electronic collaborative communication in WBL programs is a process that must be continually examined. Noting that much of the skills attained in work based learning come from reflective actions, it is crucial that this is a major part of the online movement. The reflective approach promotes much of the literatures request of focusing on the individual to make programs more successful. It is fundamental that this reflective approach is “dynamically combined” in both the institution and workplace site (Gray, 2001). Although the efforts of reflection is not new, the implementation into the new communication tools remain.

One major communication tool that has encouraged the reflective styles of students has come about with the recent developments in social media. More than ever, students are looking more towards smart phones to communicate with others. It is noted that “social networking apps appear to be the main driver for this development” as individuals communicate with one another on the go (Cook and Pachler, 2012, p. 711). The efforts of a WBL coordinator to create a common platform can use these social networking apps to communicate to students and workplace advisors. Obviously, the literature promotes more secure educationally developed aps
for using with students. Nevertheless, the technology tools are often the correct fit for students to use while in the program.

Continuing the motion towards social mediums, other elements have been quite useful for WBL coordinators, students, and workplace mentors. In fact, Dyrud (2012) expresses that “student and faculty immersion in what are becoming traditional social networks – Facebook, Twitter, LinkedIn – as well as more adventurous venues – podcasting, microblogging, wikis RSS syndication – are beginning to change the landscape of education” (p. 61). As many more are developed and old ones are modified, it will become crucial for stakeholders in WBL programs to verify that these tools fit all the necessities for better performance. This verification of performance also needs to focus on the processes that are in place when the tools are used.

Recently, people tagging has become all the frenzy for those in many career fields (Cook & Pachler, 2012). Work Based Learning coordinators are obviously apprehensive with moving too quickly on this due to security and privacy. However, as part of the progression in career development, connections must be made to help individuals find the next level of employment. Initial studies in this area have been quite informative as individuals use the tagging tools on social mediums such as LinkedIn. Perhaps one of the largest benefits of this tool is creating a place where new workers can promote skills and experiences. These tags can also be linked to various other elements that can provide “employability or life-long learning” applications (Cook & Pachler, 2012, pp. 713-714). As another tool in the arsenal of collaborative communication, coordinators can provide an outlet to share skills acquired and also use these links to connect students to potential workplaces.

There is no doubt that as the online tools of communication are utilized, globalization will be the next step in the WBL realm. In fact, more internships and co-ops are becoming more
global as international trade and business functions permit. Clearly the primary candidates for this type of program would be at the college level perhaps in international business or global studies/politics. Nevertheless, global collaborative communication can be a major benefit to any WBL learning program including high schools. Global experts in the field can share knowledge and provide examples using various online tools. Especially as “global competencies are increasingly becoming a workplace requirement, regardless of the industry or geographic location” this effort will produce higher level outcomes (Taras, Caprar, Rottig, Sarala, Zakaria, Zhao, & ... Zengyu Huang, 2013, p. 2013).

It has been well document throughout the literature that using the various tools of collaborative communication can be beneficial to student learning (Sandholtz, 1997). However, there must be methods put into place to encourage and protect the students, businesses, and institutions. Cradler, McNabb, and Burchett (2002) recognize that leadership is the key feature in making sure all parts functions properly and that achieves “systemic school improvement goals” (p. 49). Student learning must always be the central theme in all communication tools used. If the tools are not benefiting the students, it will be important to weed it out or reconfigure so it becomes a value.

Work Based Learning coordinators are working to make these online tools more beneficial by working together through ongoing professional development (PD) courses (Archambault, Wetzel, Foulger, & Kim Williams, 2010). At the PD courses, the work continues to create the best procedures to implement the new tools or redesign existing. Excitingly, there are often times that these courses are using the technologies being implemented. As an example, “the PD activities included synchronous webinars and online discussions as well as archived webinars and tutorials” in moving through the material that would be used in WBL programs
In fact, these training activities are moving beyond just within a district. WBL coordinators are realizing that shared technologies can be discussed in larger audiences and then tailored later when rejoining the district. Nevertheless, any discussions about the collaborative communication tools can provide another means to make the workplace learning experience more productive.

Integration is the key when it comes to implementing collaborative communication tools in the WBL program. The integration of these tools should be as seamless as possible and work with the overall educational environment (Bledsoe, Harmeyer, & Wu, 2014). The more this integration is the occurrence, WBL coordinators, worksite mentors, and students will be more comfortable with the usage. Whether it is secondary or higher education, the fact remains that technology usage is continuing to grow. Venable (2010) notes that “there is a seemingly endless list of technology-based tools available for use in educational and student services support settings” (p. 88). The difficult task for WBL coordinator is finding the right ones and making sure that it is implemented correctly for student learning objectives.

The use of collaborative communication in WBL education can be synchronous or asynchronous (Raymond, Kazuhide, Matsuura, Baudin, Gayraud, Yano, & Diaz, 2005). Both elements have both benefits and drawbacks that must be realized and taken into account by the WBL coordinator. Asynchronous for the most part has more options when instructing someone at a worksite. Since the student is going to be busy at the workplace and does not have much time to stop and talk, asynchronous allows for reflection and lessons taught at a later time when more convenient. Asynchronous technologies include basic e-mail, discussion boards, podcasts, websites, and other internet-delivered career guidance and information systems (Venable, 2010, pp. 88-90). Obviously, some tools will be used on a daily basis while others can be used as
supplemental material for ongoing learning in regards to student facilitation (Zydney, deNoyelles, & Kyeong-Ju Seo, 2012).

The other form of collaborative communication tools fall into the realm of synchronous. Tools that are synchronous simply “allow people to communicate simultaneously, in real time, which is to say that responses to questions are immediate” (Venable, 2010, p. 90). There is certainly a place for this type of communication as information and instant feedback are sometimes necessary to make sure that knowledge is transferred. Furthermore, this type of technology can save time as there is no delay in the transfer and can overcome those constraints (Murphy & Coffin, 2003). For example, in the sending of an email one might have to wait a while before getting a response. Synchronous technologies include the telephone where topics can be worked through together. Other types, according to Venable (2010) include instant messaging and virtual rooms (pp. 90-91). These two types of synchronous technologies open a plethora of opportunities for both the WBL coordinator and students. The projections for these tools are endless as technologies grow and new ones emerge.

There are new forms of risk with the emergence of technology. Unfortunately, most of the risk in the literature centers on student confidentiality. As an example, as data such as job involvement and pay, reflective discussions, and perhaps a video of the student working are placed online, there is little guarantee that this information will be completely secure. In most circumstances, the information will be shared among classmates and worksite mentors who in turn may continue the sharing outside the bounds of the class. Much like the technologies used in the medical fields, “the data environment is ever-evolving and constantly challenging the ability to protect confidentiality” (Meyer, Robinson, and Madans, 2012, p. 29). Thus, it will be
critical for WBL coordinators to keep up with and maintain a level of working knowledge to protect students online.

Technology implementation in any area should not be taking lightly as it influences so many parts. It is important that the inputs create equal or better outputs when it comes to execution of a new technology. After spending the time and money, it is crucial that all stakeholders benefit in the results. Obviously, WBL programs want to make sure that all stakeholders can communicate effectively. As noted in Key Strategies to Successful Technology Implementation (2015), “states, districts, and schools should favor technology design to promote high levels of interactivity and engagement and make data available in multiple forms” (p. 50). By having this philosophy already in the technology proposal phase, WBL coordinators should find it much easier to put into practice already existing technology. This can save the program both time and money in the implementation process.

Financials should always be part of the consideration when deciding to use technology tools in the classroom. There must be a balance with use and affordability. The affordability measurement must be applied to both the district putting the technology in place and the student who might have to purchase the technology. Throughout the literature, it is often noted that “most students specified that faculty should consider communicating with students initially on integrating technology in the classroom” (Wynn, 2013, p. 31). This belief for the most part shows that students are typically on board with many of the technologies. However, when it comes to the cost, WBL coordinators must make sure that students are willing to proceed on the other side.

School district or institution decisions also come into play when it comes to financials. Communication technology often needs to be updated more often making costs more expensive.
In fact considerations must be made when it comes to multiple areas of implementation including support costs, professional development, software costs, replacement costs, connectivity costs, and retrofitting costs (Ireh, 2010, pp. 18-19). Making matters more difficulty, many of these cost change throughout a technology’s life cycle. Thus, calculations can be difficult to plan when it comes to implementation. Ireh (2010) suggests that institutions “should take advantage of any and all sources of funds for their school technology programs” (p. 22). By doing this, schools will be less likely to leave funding on the table that could be used across several departments or schools in a district. Perhaps by being more resourceful with funding, WBL coordinators can bring in additional collaborative communication tools that will be advantageous for the program.

Support Communications, Learning, and Teaching

Creswell (2012) notes the positive impact of revisiting various parts of a study including the literature during the Research Process Cycle. In this circumstance, reexamination and expansion of the literature review will assist development of research questions in line with the Community of Inquiry (CoI) framework. This section will focus on how WBL coordinators use digital collaboration tools within the CoI framework to support communication, learning, and teaching.

Communication is paramount when focusing on collaborative courses such as work based learning. According to Thomas and Pamela (2015), digital communication promotes creativity allowing students to express or present in personal ways. The communication tie within learning is relevant in terms of this expression. “The chance to teach our students how to use their digital technologies in ways that further their learning not only of technology, but also of the traditional content” is an opening that can only occur with the additional opportunities to express in communication (Thomas & Pamela, p. 22).
It is often noted that education institutions are always in search of greater engagement in courses (Oblinger, 2004). The use of communication to increase contributions from multiple participants can increase the network of learning in WBL programs. Increased contribution and engagement is perhaps “the most powerful tool for changing students’ attitudes about learning” as students become the collaborators (Beatty, 2004, p. 11). As the digital collaboration tool increases in use over time, the progression of engagement can grow among students.

The activity of self-engagement often leads to much desired communication visibility which often has “direct impacts on collaboration processes” (Anders, 2016, p. 247). Communication among stakeholders facilitate an atmosphere where working together among students to learn skill traits can prosper. In this communication rich environment, “knowledge sharing becomes integrated more directly into collaborative work processes, it thereby creates new opportunities for reflective understanding that informs thoughtful action, problem solving, and innovation” (Anders, p. 255).

Digital communication tools can often provide a place for reflection. For example, Pifarré, Marti, and Guijosa (2014) express that a “wiki environment afforded the development of an effective and creative online collaborative learning community” (p. 62). Group reflections are often intertwined in student communication technologies products. The ability to group reflect can “create new knowledge” that can be used by members of the WBL program.

The support of learning is another area that the CoI framework addresses in terms of student experience. As noted by Aksal (2009), learning often is blocked by barriers that can sometimes be overcome by online learning. The role of collaborative communication technologies can help bridge this gap. These technologies provide an opportunity of ongoing contact by “impact of social presence and facilitation role” whether it be teacher or tutor (Aksal,
This individual contact often provides “more attention to the expressed needs of students, to how teachers try to balance expressed and inferred needs, and to how unsatisfied needs work against success in school” (Noddings, 2005, p. 158). By focusing on the needs of the students, meaningful interventions can take place quickly and concisely thus improve the learning environment.

According to Gonzales and Young (2015), “the design and delivery of instructional learning spaces and practice must change” to improve learning opportunities (p. 28). Work Based Learning programs have begun including additional avenues of learning spaces using technology. This shift to “learner centered” environment “includes culture shifts such as: College and career ready expectations. Collaborative, relevant and applied learning. Personalized options with student voice and choice. (and) Flexible anytime, anywhere learning.” (Gonzales & Young, p. 30). This personalized learning can be achieved comfortably in a digital environment as it has become an “integral part of their everyday lives” for students (Bennett, Maton, & Kervin, 2008, p. 775).

The WBL program provides a start to mentoring that later becomes “an integral aspect of everyday professional life” (Duffy, 2013, p. 50). Mentoring encourages ongoing feedback that can improve the traits of self-reflection which “influence on behavior should ultimately have a positive impact at the organizational level” (Donovan, Güss, & Naslund, 2015, p. 293). Duffy (2013) notes that “mentors are responsible for providing students with regular constructive feedback to ensure that they are meeting their learning objectives” (p. 56). This mentorship can occur in an established online learning community that can easily branch out to social networking in the future. In regards to this expansion, Holmes (2013) notes that “online learning
communities are now being used to support groups of learners to collaborate, critically reflect and develop shared meaning with peers” (p. 106).

Support of teaching is the final area that the CoI framework addresses in terms of student experience. In teaching, we must not “neglect the learners and the powerful role they can and must play if we truly want to transform the experience and outcomes of education” especially in terms of personalized learning (Rickabaugh & Temple University, 2015, p. 4). Having students connect to concepts from multiple subjects and community can broaden the learning experience dramatically (Sobel, 2004). The benefits of establishing clear concepts that can be connected to the individual can be a positive student experience.

Hammerich (2014) notes that “a learner-centered syllabus…grounded in sound educational theory” assists teachers immensely in regards of organizational structure (p. 284). In the use of collaborative communication technologies, this organization can be planned and adapted in an ongoing manner.

As students are progressing through the individualized work based curriculum, ongoing research is often encouraged. Gordon, Booth, and Bywater (2010) express the importance of “interprofessional learning” that can occur in various formats and especially online (p. 544). These additional research opportunities can provide links that help a student grow in terms of career training and “finding solutions to real life practice situations” (Gordon et al., p. 545). In teaching, it is crucial that all students are progressing forward and as noted by Wake and Bunn (2015) sometimes there can be drawbacks to moving online. Increasing comprehension of material can be greatly assisted with technology (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010).
Conclusion

The interconnectedness of collaborate communication technology in the area of CTE and WBL are quite vast. As the literature shows, CTE is all about preparing students for the workforce. WBL which is a category of CTE provides the opportunities for students to do so by participating in internships, apprenticeships, and other worksite training sequences. The students that have the possibility to work on the jobsite are provided the skills for career advancement at a much higher level.

Career Technical Education programs that work together regularly with industry provides a better opportunity to deliver trained students. Working with industry allows the WBL program to grow in the right direction so that it fits the workforce needs. It is noted that lack of training in individuals significantly hurts the overall economy. Thus, producing well-qualified candidates improve company interest in that geographic area. The literature brings up excellent examples of working with business through industry organizations. These organizations want to share as many resources as possible so that students are aware of that type of industry.

The addition of the STEM curriculum has created a boost to CTE as science, technology, engineering, and math skill needs have hit center stage in the United States education system. Alignment between CTE and STEM promote more career paths for the individual student. The number of career paths offered grows daily as these fields develop and change to meet needs of the economy. The literature points out that it is essential that teachers from different subject areas work together across the country to achieve this goal. Thus, CTE teachers work daily with math, science, and other specialized teachers directly. This ongoing sharing viewpoint also occurs in the various conferences offered in education fields propelling programs to the next phase.
Work Based Learning coordinators, according to the literature must be prepared to meet the challenges of motivated leaders that are pushing for vocational skill level improvement. The connection between WBL success and the local economy is forefront. The direct approach in training allows the individual student to make well-grounded choices for the future. In fact, these programs bring on a more significant opportunity for reflection and growth as an individual. Larger geographic areas are recognizing that working together with the institution and student to build better CTE programs is advantageous financially. As technology and industry press forward, it will be crucial to have these connections to meet the demands and provide instruction avenues for students.

Collaborative communication technology provides an opportunity for all the interconnectedness to transpire. The online connection allows students to share and gain knowledge continually while reflecting along the way. It is crucial that this web-based learning meets the needs of all stakeholders including the institution, workplace mentors, and students. For these tools to work effectively, a high level of comfort must be in place among the stakeholders. The literature reports that this technology must be continually examined as new communication tools are always coming online. Social networking apps and tagging tools have created a wide range of opportunities for students to interconnect with each other and knowledge experts. As the economy becomes more global, the movement into these tools will provide more flexibility.

The WBL coordinator must receive ongoing training in the communication technology area to make sure that the tools align with the goals of the institution. It will be vital that PD courses are offered to increase comfort among all when it comes to both synchronous and asynchronous tools available. Other parts of use will also need to be taken into account,
including student confidentiality and security. Protecting students using online tools will require the WBL coordinators to be highly trained and ready to assist when the time arise. Furthermore, coordinators will need to manage budgets and access sharing when it comes to the technology, making sure that all areas of cost are factored.

The literature provides a platform to objectively examine the influences that collaborative communication technologies has on WBL. The literature offers a basic roadmap for exploration into WBL programs. Reexamination and expansion of the literature review has provided a basis of questioning when it comes to how WBL coordinators use digital collaboration tools within the CoI framework to support communication, learning, and teaching.
Chapter Three: Research Design

In work based learning (WBL) programs, coordinators have an expanding choice of digital tools so that students increase collaborative and reflection between WBL coordinators, work based mentors, program administrators, teachers, and other students. Lack of attention in research has been focused on how these digital communications tools and social aspects are integrated in regards to the educational experience hampering implementation from school policy makers.

The purpose of this doctoral thesis was to explore the application of digital collaborative communication in regards to the overall educational experience in the WBL program. Coordinator perceptions explored will include the types of digital collaboration tools, practices of integration, and role served with in a WBL program employing the Community of Inquiry (CoI) framework. Therefore, the overall research question guiding this inquiry was: What are the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ educational experience? The following sub-questions were asked in order to inform this overarching question:

1. How do WBL coordinators use digital collaborative communication tools to support communication?
2. How do WBL coordinators use digital collaborative communication tools to support learning?
3. How do WBL coordinators use digital collaborative communication tools to support teaching?
To examine these practices within the context in which it occurs, basic interpretive qualitative study was utilized (Merriam, 2009). The basic qualitative research design and methods for this study are discussed in this chapter.

**Research Design – Qualitative Research**

The philosophical framework for this study is situated in the interpretive/constructivist paradigm. This paradigm was advanced from the study of hermeneutics, otherwise known as interpretive understanding from philosophers such as Edmund Husserl and Wilhelm Dilthey (Mackenzie & Knipe, 2006, p. 3). Interpretive researchers “accept that there may be multiple perspectives that must be represented” as each individual can interpret differently (Willis, Jost, & Nilakanta, 2007, p. 277).

Interpretive research, which is the most common type of qualitative research assumes that reality is socially constructed; that is, there is no single, observable reality. Rather, there are multiple realities, or interpretations, of a single event. Researchers do not “find” knowledge they construct it. (Merriam & Tisdell, 2015, p. 9)

Creswell (2009) notes that constructivist “develop a theory or pattern of meanings” from research trusting on “participant’s view” while acknowledging own self-knowledge (pp. 8-9). This constructivist paradigm encourages “qualitative methodologies to investigate the issue adequately” (Brown, 2001, p. 158).

Qualitative research provided an avenue to capture experiences of high school work based learning coordinators with digital collaborative communication tools in enhancing students’ educational experience. Qualitative is noted as “research that produces finding not arrived at by means of statistical procedures or other means of quantification” (Strauss & Corbin, 1990, pp. 17-18). In this exploratory study, the accounts from those experiencing the activity are
essential in understanding the support of communication, learning, and teaching. Merriam (2009) expresses that qualitative research attempts “understanding how people construct their worlds, and what meaning they attribute to their experiences” (p. 5).

Exploring WBL coordinators perceptions of digital collaborative communication tools advances meaningful information in the program area. Merriam (2002) detailed the following in regards to basic interpretive qualitative studies:

A basic interpretive and descriptive qualitative study exemplifies all characteristics of qualitative research…the researcher is interested in understanding how participants make meaning of a situation or phenomenon, this meaning is mediated through the researcher as instrument, the strategy is inductive, and the outcome is descriptive. In conducting a basic qualitative study, you seek to discover and understand a phenomenon, a process, the perspectives and worldviews of the people involved, or a combination of these. (p. 6)

As Thomas (2006) notes, this analysis utilizes “detailed readings of raw data to derive concepts, themes, or a model through interpretations” by those researching (p. 238). Thus, the application of digital collaborative communication in regards to the overall educational experience in the WBL program will be further discovered through interpreted themes during the study.

**Research Site**

The site selection was the first level of sampling involved in this study. The selection of a large school district in north Georgia provided a sufficient site for accessibility of study and meets the requirements of containing a WBL program that implements digital collaborative communication. At this site, the researcher had unique access to the processes that occur in the WBL program that are typically inaccessible. The research site worked well for this study as Yin (2013) notes the importance of maintaining a focus towards significance in qualitative
studies. The selection of this site is noteworthy in the fact that there are established WBL programs using collaborative communication tools and can provide insight into the processes that occur during the WBL activities.

**Time Frame**

Beyond the scope of site, it is vital to set the bounds in regards to time to increase relevance. The “in-depth study of a particular instance or case will illuminate that interest” can often be explicitly related to a time period (Merriam, 2009, p. 90). Thus, the time period for this study focused on the activities during the 2016 school year. This time period is strategic in choice as the activities, reflections, and documented assignments are being completed. By doing this, it is hoped that meaningful documents will be openly accessible and also remove some of the barriers when it comes to interviewing as noted later in participant selection.

**Participants**

Participants made up the second level of sampling in this qualitative study. The focus of this study included interviews from nine WBL coordinators available to record their perceptions of digital collaboration communication tools in regard to the educational experience. These interviews confidently provided descriptions that “successfully merges the participants’ lived experiences with the researcher’s interpretations of these experiences, thus creating thick meaning for the reader as well as for the participants and researcher” (Ponterotto, 2006, p. 547).

A combination of both purposeful and convenience sampling was used to provide the researcher the best opportunity to gain meaningful information as each are involved in a school WBL program that uses some sort of digital collaborative communication to operate (Creswell, 2009). This sample of the WBL coordinators provided significant insight into the social reflection (communication), technological facilitating (technologies), and the exploration of
work-related curriculum in a real-world environment (work-based learning) as related to the CoI framework. The high school WBL coordinators provided the opportunity to explore the establishment of integration and roles that took place during the program. The detailed experiences shared from these participants centered on processes that are beneficial to the overall collaborative communication in the WBL program.

**Recruitment and Access**

The site selection and participant recruitment for this study was based on the fact that it is accessible to the researcher and meets the requirements of the overall focus. Thus, the sampling strategy is both purposeful and convenience. The selection criteria of being an active WBL coordinator “seeks to maximize the depth and richness of the data to address the research question” (DiCicco-Bloom & Crabtree, 2006, p. 317). In this study, purposeful sampling was used to “narrow the range of variation and focus on similarities” (Palinkas et al., 2015, p. 534).

As noted by Creswell (2012), it is beneficial to select contributors that are agreeable and likely to participate. Thus in both site and overall participant recruitment, a convenience sampling method was used to increase the likelihood of both access and contributor involvement.

Marshall (1996) notes that convenience sampling is used to find the “most accessible subject” in relation to the researcher (p. 523). In this circumstance, this type of sampling is used in terms of location and time, helping the overall progression of the study.

Invited participants were found using an Internet search discovery. Invitations for the interview process were emailed (see Appendix C for recruitment email) explaining the purpose of the study and informed constant. It was noted in the email that face-to-face interviews would take place at the time and location in which the participant chooses. Data collected from the
interviews were attached to a pseudonym name so that confidentiality was secure and anonymous. The WBL coordinator interviews were the epicenter in the study.

**Protection of Human Subjects**

This qualitative study provided ethical protection for the WBL coordinators that assist students while training in the workplace/jobsite. The research process does not present any apparent risks to any participant. All subjects were voluntary participants who could opt out at any time. Furthermore to protect identity, all participants in the study remained confidential. McDermid, Peters, Jackson, and Daly (2014) promote confidentiality as it creates a connection that “involves trust and respect for the participant and the information that is shared” (p. 31). Confidentiality was implemented to ensure that no penalty came from shared information. Furthermore, confidentiality permitted focus to be placed on the beneficial findings rather than the individual.

Consent forms including a specific outline of the study were provided for participants. Montalvo and Larson (2014) endorse a consent form that is “more concise or content specific” in relation to the study (pp. 426-427). A detailed consent form allows greater access without harming the group/s being researched.

Ethical practices must be forefront in any research study as the accuracy of the information is essential. Creswell (2012) expresses that information and data must be pure to avoid ethical violations. To protect information that is collected, the researcher will make sure that it is organized and placed in context of those that provided the data. As a member of the school system, information gathered must be tied to the study rather than the individual. The researcher understands that the information attained should be recorded in a straightforward manner.
The methodology of this study included interviews where information was ascertained in an open manner in a comfortable environment. The researcher was in a position as both teacher and colleague within the school system. Coordinators of WBL could have felt pressure or apprehension to answer questions due to this relationship. Thus, it was important to inform that participation was voluntary and answers did not influence relations.

Data Collection and Storage

Qualitative study data comes from an array of sources during research (Yin, 2013). In this exploratory study, the researcher used interviews, artifacts and memo.

Interviews. This study included interviews with several WBL coordinators from various high schools in the district. The school district located in north Georgia is accredited by the Southern Association of Colleges and Schools Accrediting Commission with a student population of nearly 100,000 and offers WBL programs that implements digital collaborative communication. Convenient to the participant, these selected individuals were interviewed face-to-face and one-on-one with open-ended questions. A question guide (see Appendix A for interview protocol and questions) was used providing semi-structured queries that provided flexibility in acquiring needed data for the study. Interviews were done using the conversational approach addressed by Rubin and Rubin (2011).

Yin (2013) recognizes that interviews are crucial in understanding human actions. Specific facts were collected from interviewees at the beginning including title, role and integration activities for digital communication tools, and involvement level. For the primary focus of the interview process, the researcher used the CoI framework and the literature shared in chapter 2 to guide interview questions examining social reflection (communication),
technological facilitating (technologies), and the exploration of work-related curriculum in a real-world environment (work-based learning).

Interviews occurred in a two stage protocol as follows:

1. Interview contained introductory background information and open ended questions with prompts exploring how WBL use digital collaborative communication to support communication, learning, and teaching. Furthermore, the interviewee discussed an artifact brought in regarding digital collaborative communication for the WBL program. Lastly, anything else that the interviewee feels that needs to be added was conveyed. Approx. 45-55 minutes

2. Member-checking interview took place to make sure that all interview questions were explored and if there were any other questions that might have arisen during other interviews that needed to be addressed. Lastly, anything else that the interviewee wanted to share was addressed. Approx. 15-20 minutes

Participants in interviews were provided a pseudonym and made anonymous to protect confidentiality. Interviews were recorded and the researcher took field notes through reflective memoing to capture distinctions and expressions outside of the recordings. Research process evolvement was sustained through keeping interviews appropriate by progressing during questioning to match responses throughout in relation to grounded theory (Corbin & Strauss, 1990). Interviews were transcribed within a three-day period using Rev.com transcription services. All data collected during this processes was stored on a secure encrypted device for research accessibility.

Artifacts. The use of artifacts provides an opportunity to comprehend the overall study during the interview process. This artifact selected by the interviewee and brought in for
discussion during the interview, provided better clarity on what was being discussed and provided clarification. Furthermore, the artifact assisted the interviewee in expressing the activities that occur using digital collaborative communication in the WBL program. The artifact was reviewed in correspondence acquired research questioning. Artifacts provide a method for “discovering context-laden patterns and understandings” (Marshall & Rossman, 2014, p. 179). All documentation was reviewed, identifying text removed, and items copied were placed on an encrypted storage device.

**Reflective memoing.** The activity of reflective memoing occurred during the study to document the overall process. Maxwell (2012) notes that memoing provides an opportunity of “serious reflection, analysis, and self-critique (p. 20). The ongoing practice throughout the study provided a way to discover items that may have otherwise been missed. Memoing in the interviewing process brought about additional questions to explore or additional identification of themes. It is important that memos are “written after each interview to facilitate analytical thinking about the data and to help remember details” which assisted in capturing experiences (Maxwell, 2012, p. 195).

**Data Analysis**

Data analysis is when the raw data comes together to be processed into significance. It is often described as the most cumbersome part of the research process by Yin (2013). Data analysis according to Merriam (2009) involves “consolidating, reducing, and interpreting what the researcher has seen and read” to find that significance within the qualitative study (p. 176). Although complex, the data analysis process achieved the principal goal of finding out how electronic communication influences work base learning programs.
The procedure of data analysis always starts with organizing the massive amount of information that comes about from a study. Information from the documents reviewed, interviews, and observation need to be arranged in order and categorized. Often times, the information gathered needs to be combined to make it more meaningful through the synthesizing. The researcher started this organization stage during the data collection phase as promoted by Merriam (2009) to relive some of the pressures of becoming overcome by data. Also, reflective memoing provided notes taken during document review, interviews, and observation that assisted in the first phase of organization by identifying similar themes discovered, irregularities, or other useful information.

The data was collected within an eight week period and then deepen into a full analysis phase. After data is collected, the transcribed interviews were examined for commonality or links as suggested by Merriam (2009). Also, irregularities were identified and compared to the field notes. The progression of open, pattern coding, and a priori provisional produced codes that can be used as networks. Part of the process of identifying these codes will come from the use of the MAXQDA 12 software program. This program assisted the researcher in the identification of common themes that were brought forward for full study analysis.

**Open Coding.** During the process of open coding, the data was initially reviewed from written form to identify key terms and themes. It is important “to analyze the data minutely” so that themes are not skipped (Strauss, 1987, p. 31). Babchuk (1996) notes that “in open coding, incidents or events are labeled and grouped together via constant comparison to form categories and properties” (p. 2). During this initial read through, the themes came about “from deep inside the data” (Neuman, 2011, p. 511).
**Pattern coding.** The use of pattern coding was used as a second cycle to assist in the interpretation of themes. The process reduced the number of themes during this cycle of coding. Saldaña (2009) notes that pattern coding “pull(s) together a lot of material into a more meaningful and parsimonious unit of analysis” (p.152).

**A priori (provisional) coding.** The a priori provisional coding was set as a third cycle that came about from projected themes that occurred before data was analyzed (Saldaña, 2009). These codes were based on the Community of Inquiry framework exploring the overall educational experience in work based learning centering on social, cognitive, and teaching presence (Garrison et al., 2000).

**Trustworthiness and Transferability**

The legitimacy of qualitative research comes about by the planned design and ethical practices. As noted by Schwandt, Lincoln, and Guba (2007), trustworthiness is formed by addressing the integrity of explanations. Yin (2013) promotes a structured design process with the development of proper study questions, opening propositions, analysis procedure, theme linking, and interpretation criteria. The importance of procedural structure is the pillar that studies rely on when it comes to validity. This evaluation of the phenomenon should be occurring within the structure while in action (Merriam, 1998). The constant comparative method assisted in making sure that the data is flowing into a manageable structure as noted by Merriam (2009).

It was imperative to remove any bias when it comes to analysis of data. To promote validity, the researcher used peers that are knowledgeable about the subject to review data and findings. Furthermore, triangulation through member-checking was used when it comes to data
to safeguard validity of the study Yin (2013). The triangulation method compared the information brought about by the interviews and interviewee artifacts.

Reliability is often associated with the ability to match the findings at a later time if the same procedures are followed (Yin, 2013). Thus, it was crucial to maintain a set structure of analysis throughout the entire process. Creswell (2013) suggest that the use of detailed records from the researcher through reflective memoing can be used to connect the study themes. These investigator notes can then later be used as a tool to replicate the process at other institutions.
Chapter Four: Report of Research Findings

The goal of this study was to explore work based learning (WBL) coordinators’ perceptions in regards to the application of digital collaborative communication to the overall educational experience in the WBL program. Utilizing the defined analysis steps outlined in Chapter 3, it was discovered that all participating WBL coordinators had meaningful insights to share concerning the implementation of digital collaborative communication tools. The themes emerging from analysis are reflected in relation to the overall research question guiding this inquiry and the three sub-questions developed for this study: What are the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ educational experience?

1. How do WBL coordinators use digital collaborative communication tools to support communication?

2. How do WBL coordinators use digital collaborative communication tools to support learning?

3. How do WBL coordinators use digital collaborative communication tools to support teaching?
Participants

<table>
<thead>
<tr>
<th>Name *</th>
<th>Years Employed in Education</th>
<th>Years as WBL Coordinator</th>
<th>Level of Education</th>
<th>Gender</th>
<th>Student Experience in WBL Program High School / Other</th>
<th>Student Job Desire</th>
<th>Program Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alex</td>
<td>11</td>
<td>2</td>
<td>Bachelors +</td>
<td>Male</td>
<td>No / Other Apprenticeship</td>
<td>Business</td>
<td>15</td>
</tr>
<tr>
<td>Beth</td>
<td>4+</td>
<td>3</td>
<td>Masters</td>
<td>Female</td>
<td>No / Other Internship</td>
<td>Varies - Career</td>
<td>~20</td>
</tr>
<tr>
<td>Christy</td>
<td>26</td>
<td>10</td>
<td>Bachelors +</td>
<td>Female</td>
<td>Yes / NA</td>
<td>Varies - Business, Travel</td>
<td>&lt;15</td>
</tr>
<tr>
<td>Dakota</td>
<td>21</td>
<td>5</td>
<td>Masters</td>
<td>Female</td>
<td>No / No</td>
<td>Varies - Business, Engineering</td>
<td>49</td>
</tr>
<tr>
<td>Edward</td>
<td>8</td>
<td>1</td>
<td>Bachelors</td>
<td>Male</td>
<td>Yes / NA</td>
<td>Varies - Career</td>
<td>~23</td>
</tr>
<tr>
<td>Faye</td>
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<td>Specialist</td>
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<tr>
<td>Gabby</td>
<td>10</td>
<td>9</td>
<td>Bachelors +</td>
<td>Female</td>
<td>No / Other Internship</td>
<td>Medical</td>
<td>18</td>
</tr>
<tr>
<td>Herb</td>
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<td>17</td>
<td>Masters</td>
<td>Male</td>
<td>Yes / Other Co-op</td>
<td>Transportation</td>
<td>63</td>
</tr>
<tr>
<td>Indy</td>
<td>~13</td>
<td>2</td>
<td>Masters +</td>
<td>Male</td>
<td>No / Other Internship</td>
<td>Varies - Career</td>
<td>~16</td>
</tr>
</tbody>
</table>

Table 1: Participant demographics. * Denotes that names have been changed to protect identity.

The participants interviewed in this study were from the same school district located in north Georgia and are practicing WBL coordinators from various high schools. The school district is accredited by the Southern Association of Colleges and Schools Accrediting Commission and has a student population of nearly 100,000. The district offers high school students the opportunity to enroll in WBL programs that implement digital collaborative communication. The WBL coordinators provided significant insight into the social reflection (communication), technological facilitating (technologies), and the exploration of work-related curriculum in a real-world environment (work-based learning) as related to the CoI framework. Furthermore, these high school WBL coordinators provided an avenue to explore the incorporation and role of digital collaborative communication within their program.

The participants in the study were asked to share some background information about themselves and connection to work based learning. The group consisted of nine participants including five females and four males. Those interviewed were questioned about their overall experience in education. Most participants in the study stated that they were well established in
the field of education. The average amount of years the participants were employed in education is approximately 18 years. Beth came in with the least amount of experience in education at more than four years if you add in part-time employment. Herb was at the other end of the scale with 27 years of experience. Four of the participants had more than 20 years of employment in education and two had less than 10 years. All interviewed had experience in some other role of education before joining or starting a WBL program at their school.

Continuing with experience, participants provided the time that they have spent being a WBL coordinator. The amount of experience as WBL coordinator ranged from one to 17 years with only two individuals having 10 or more years. Although having eight years of experience in education, this was Edward’s first year as a WBL coordinator. Again, Herb was the most senior in the group when it came to WBL coordinator at 17 years. The experience average for the group is approximately six years. Alex stated, that he “transformed into the role of WBL after the last lady retired several years ago.” Every participant shared a previous role or wait before entering their current position with nearly a three to one ratio when it came to employment in education to WBL coordinator experience. Thus, the role of WBL coordinator in this case is obviously a more experienced position in the education field.

The WBL coordinators interviewed shared their current level of degree in education. Each participant in the group had at least a Bachelors with only one lacking additional education. Those interviewed come from a vast array of degree fields including computer science, business, nursing, communications, and several areas of education. All participants have a degree or certificate in some field of education to be hired by the school system. The education fields include Business Education, English Second Language (ESL), Administration and Supervision,
and Healthcare Sciences. Lastly, in regards to degree level, four participants had their Masters and one individual had a Specialist.

The final background question of participants had to do with their personal involvement during school of a WBL program. This was broken down into two categories including student experience in high school and experience elsewhere or other. Interestingly, only three of the nine reported that they had a personal experience in a high school WBL program. Christy stated, “I worked in an ice-cream shop my senior year. It was a fun experience where I learned a lot.” Edward noted, his time when he “worked at a lumber store in my town that hired high school students to work as cashers and put tools out. Nothing too special but I was able to make some money and get credit.” He continued as he remarked that this was a positive experience or “a win”. Lastly, Herb expressed how he ended up doing an apprenticeship at a large automotive company. He stated, how he “rotated through all the different manufacturing administrative positions over the two years” during high school and ended up receiving a scholarship. Each one of these shared experiences provided a positive memory for the participants which may have influenced their career choice.

Continuing the discussion on student experience, five of the participants stated that they had experience outside of high school. Alex mentioned his apprenticeship and military experience when it came to Information Technology training propelling these skills to civilian careers. Beth, Gabby, and Indy all identified that they did internships while in college. Indy showed a meaningful connection, “I did an internship with a local bank when I was in junior college. It actually changed my goals in wanting to go into business education.” Lastly, Herb continued his training in a co-op while in college. Two of the participants in the study noted that they did neither high school nor other training programs while in school.
Participants were asked to discuss the basic elements of their WBL program including student job desire and program size. Some WBL programs have career areas of focus because of school area need or connection to student job desire. This need or desire of the school and community encourages the WBL program to target the careers necessary to focus. Beth, Edward, and Indy are three schools that provide various choices to all school-offered career technology pathways. Three offer more focused options including Alex with business, Gabby with medical, and Herb with transportation. Some programs covered more options including Christy with business and travel and Dakota with business and engineering. Although these programs focused, there were options outside of the career areas if needed, requested, and approved at the school level. Faye provided services to “students with special needs, learning disabled behavior disordered, in the career technology setting that go into the work force. That includes every career technology course we offer.” Overall, this group of participants provided a wide array of choices when it came to job placement options for high school students.

The size of each participant’s WBL program varied from approximately nine to 63 students. The programs overall averaged roughly 36 students. Faye, focusing on special needs students had approximately nine students generally. Herb has 63 students concentrated mainly within the field of transportation. Alex noted, that “it fluctuates” when it comes to programs numbers and that school size plays a role. Christy described, that “the number depends on the students coming through the pipeline to me.” She continued that some coordinators are part-time which will also influence number of students enrolled. Gabby totaled, “18 seniors that intern in various medical environments in the community” illustrating that the field makes a difference in number. Overall, those interviewed had more than 15 students in the field except for Faye, which worked with around nine special needs students.
Findings

Six major themes emerged regarding the use of digital collaboration tools. Digital collaboration tools:

1. Promote ongoing student portfolio creation that aligns with work force skills.
2. Amplify student sharing and discussion capabilities.
3. Require patience to provide beneficial results.
4. Increase efficiency and convenience.
5. Improve the ability to regularly update learning material and provide continuous access.
6. Increase the availability of a student safety net for those struggling or adapting to the new digital skills.

Each of these themes, along with the data supporting the theme is presented below.

Digital Collaboration Tools Promote Ongoing Student Portfolio Creation that Aligns with Work Force Skills

A prominent theme that emerged from the analysis of WBL coordinators interviewed contains the belief that digital collaborative communication tools promote ongoing student portfolio creation that aligns with work force skills. The alignment with work force skills is a crucial element in career technology education preparing students for emerging careers of the future (Partnership for 21st Century Skills, 2004). One element that was common across all programs was the creation of a student portfolio which could be shared with upcoming colleges or employers. The participants felt that digital collaborative communication tools promoted the practice of student created portfolios.

Each participant described the methods of portfolio building in different ways. However, at the end of each program, students had a portfolio of their experience. In Dakota’s program,
her students do portfolios along the way within an assignment format. Dakota noted, the students use Google to create and “share it with me and then instead of having to carry around a lot of papers and shuffle and figure out what's going on, they have this electronic portfolio”. By bundling assignments throughout the year, the students in the program can “show to employers” items that were worked on in a collaborative environment according to Dakota. Other programs were a bit more prescribed in student portfolio creation. For example, Christy noted, “the student get a whole semester portfolio assignment book at the beginning.” The portfolio assignments are upfront with some examples provided for students.

The portfolio connection to careers is a strong element that aligns to work force skills. Christy declared, “Students really take charge of their own learning in the work experience.” In alignment with the portfolio Christy stated, “The digital aspect tends to give students a way to document their work and experiences.” Gabby continued this alignment discussion by stating, portfolios provide a “digital history of my class that they can show to prospective employers regarding their goals and their resume, and their employability skills.” The ongoing assignment portfolio provides an avenue for reflection when it comes to work force skills. Edward recognizes, that the “reflection process is perhaps the strongest point of learning for the student when it comes to career skills” and that this occurs during the portfolio development.

The process of developing a portfolio is varied from program to program. Dakota noted, that “we have a calendar just like a business would do” further tying into the work force skill element. The adoption of a digital portfolio creates an opportunity to share timelines with students that can be individualized based on the work skills involved. Christy stated the need for individualization, “Some students would work fast while others were painfully slow. Others would get lost in between. By using digital, I am able to release parts and explain and get much
better results and progress from students.” This varied development of portfolio includes Faye’s program that is special needs aligned as “Every year the students are required to put together an online portfolio of all the information related to work-based learning for the year.” Unlike many of the other programs, this portfolio is a product of collaboration. The students in this program are provided ongoing assistance during the portfolio development process.

Those interviewed were overwhelmingly positive when it came to the digital aspects of portfolio creation. Dakota provided feedback on the overall student’s personal development.

The portfolio is a great place for that because they talk about their philosophy about work. They don't do that until they've been in for maybe two, three months I think. Then the other thing is when it's on there, like for our exam, I have people go back and look at that e-portfolio and then they update it. They reflect on changes in themselves since the beginning of the semester. You know that just ...

It's really easy to do when it's visible and tangible like that, so I think it's been really helpful for that.

The ability to develop the philosophy over several months can be a tremendous asset to the students overall career development. As Dakota noted, the portfolio is something that is real and provides a bridge for students to share their growth whether it be an exam, job interview, or self-reflection.

The ability to create a specialized element for others to view is continued by Faye when it comes to the student portfolio.

For them, it's really this online portfolio that they have to complete. It's a six to seven part piece where every month they're responsible for another piece to the
puzzle. It's them going online, seeing what's asked for, writing the papers, writing the resumes, obtaining the references, uploading those references.

The students overall tend to take more responsibility for the sections of the portfolio and personalize it to meet their needs. As noted earlier, the portfolio has become the center point for many of the programs. With the increase in digital access, this element within the WBL program can be specialized to the needs of the student.

Lastly, the online student portfolio establishes a document to be drawn upon in the future. Herb expressed how students are able to develop unknowingly in the program and at a later time go back and explore that growth.

One of the benefits of digitized communication is the fact that a student actually have a running history of their entire work here, and as they started out in August of a year, they could ... They have many challenges, many fears, or whatever, and then by the time graduation rolled around, if they were still very interested in this career path, they could actually see progress where they started at the vet's office, and knew nothing.

With the adoption of the digital portfolio, the students can review their own path and visualize the growth that occurred. Herb continued, “they can actually see what’s in front of them, what had gone on, as opposed to just thinking, and they actually had proof for their portfolios, which we had them document at the end of the year.” Whether it is a vet office or some other career, progress becomes an element that can be shared with others in the digital WBL portfolio.

Digital Collaboration Tools Amplify Student Sharing and Discussion Capabilities

Another theme that was brought forth from the analysis of WBL coordinators’ interview transcripts was that digital collaborative communication tools amplify student sharing and
discussion capabilities. Student sharing and discussion practices are an integral part of the WBL program. This is often where students tie the jobsite experience to knowledge that was classroom based. Furthermore, students are able to receive information about other jobsite happenings.

Most of those interviewed explained that this amplification of student sharing and discussion came about because of the ability to transfer files. Alex described his experience with the use of Google Docs and the ability to push files.

The students will then push the files back to me where I can see what they are doing while on the job. They really like the quick feedback that they get. The students also have the opportunity to share these files so that they can produce files from multiple students. This is really helpful when students are able to work in groups and then produce presentations together about what they are learning in the field.

The ability to freely move written communication files back and forth between the coordinator and fellow students provided additional avenues of sharing. Alex continued, “It is more or less like a ping pong. Students share what is going on and coordinators provide feedback.”

Additionally, when students need to work together with files, this ability to share greatly increased capabilities in producing presentations within a team format.

Many of those interviewed expressed a sense of novelty when it came to students using digital collaborative communication tools in the WBL program. Herb expressed this feeling of excitement as the program was able to proceed with a different philosophy than most at the local school.
The novelty of the electronic communication was very interesting to the students. They like using it, because it was something different. Something which their regular core teachers do not use so they feel kind of special. The fact that they were being allowed to use text messaging and Google Docs. I use it extensively to communicate with the students throughout the day. Even though, at that time, cell phones were not to be used in high schools, which really went ... Was widely used, but the administration preferred not to even acknowledge its existence, but I use it throughout the day for relaying requests, assignment updates, drop in request. When you manage that many students, it's a physical impossibility to have them standing outside of your door at the end of their school day.

This sense of going rogue among students tended to encourage the use of the tools when it came to communicating with the coordinator, jobsite managers, and other students. Herb stated that “students immediately identified with this type of communication because of its instant response and the lack of paperwork.” This excitement of the tools certainly provided a platform to build communication upon as students moved into sharing and discussion needs.

The additional way for students to communicate was evident throughout many of those interviewed. Beth simply shared that digital collaborative communication tools “provides another avenue for all of us to communicate.” The avenue is also available all the time which provides an ongoing loop of communication. Indy expressed how these tools “allow multiple people to edit documents at a time and students will together put together some assignments like presentation or papers.” The convenience of openness when it comes to both capability to multi-edit and work within the varied availability of student schedules, these collaborative
communication tools certainly influence program experience. Indy furthered this open availability stating that “it has really helped students that may live far apart and can never link up with busy schedules.” The flexibility of file access and sharing provides students greater opportunity to express observations openly.

The amplification that comes about from these tools have increased the establishment of a learning community within the WBL program. Christy noted, "Students work as individuals and then group up in a learning community online.” The various platforms tools used by WBL coordinators typically had some type of movement to a community atmosphere of discussion for students to join. She provided confirmation of sharing when it came to the entire group creating a resume both at the beginning and adding on all the skills at the end of the year.

It provides a way to show a wealth of knowledge that can be shared among the group. It tends to produce a team environment that can be used to motivate the discussions, understanding that students have important things to say and how the teacher and worksite can work together to help foster and build that overall knowledge owned by the group.

The team environment can often motivate students to partake in the discussions and share the knowledge that they connected to their worksite. As the interconnected increases because of the tools, the opportunities for students to share their new found knowledge intensifies too.

Interestingly, with the increase in connectedness among students, there are still students that are apprehensive to partake. In analysis, even these students can be brought into the discussion and sharing due to the digital collaborative communication tools utilized by the WBL coordinators interviewed. Christy explained that “the overall experience draws out the student that is comfortable online but not so much talking out in person.” Students today are much more
comfortable using technology to express their opinions. She continued that “the group as a whole can then help build up this individual that would not have been heard from.” This building can spark even more feedback and discussion from the group. However, she noted, “It is crucial to monitor the discussion boards to make sure that the person does not get shut down or put down” as this can have a negative influence on the whole group. Dakota encourages the interconnected groups, “They can work with their friends; their friends can pull it up and look at it and make suggestions to them.” This increases the frequency of discussion and often helps produce a better product when applied to the portfolio.

Much of the communication in WBL programs pass through discussion board type tools. The input from students can vary from new things learned on the job, likes and dislikes, answering of questions, or many others topics that are connected to the program. Christy explains that when opening up discussions, “we tend to handle that in discussion groups.” She goes on to describe how a question will be placed on the discussion board and then it will stream from there.

I will put up a statement that says to describe proper work attire. Once that discussion board has been started, the students go with the flow put what they think would fit for that topic. Once the discussion has finalized for the week…I then put up a list about the topic from professionals.

This loop method of putting a question on the discussion board, having students providing feedback, and lastly providing responses from professionals creates a connected learning group. Continuing this loop methodology, Gabby described a process of having students to mock business interviews of each other and then switch places using online video broadcast. The process stimulating discussion was additionally promoted according to Gabby, as students “come
up with questions to see how it was to be in both roles.” Then, to finish the process, the students provide answers to those questions created by the students playing those interviewer/interviewee business roles. The flexibility of the digital collaboration communication tools provide the opportunity for WBL coordinators to use a looping methodology to have students share their experiences.

**Digital Collaboration Tools Require Patience to Provide Beneficial Results**

Another theme that emerged from analysis of interviewed WBL coordinators indicates that upstart experiences of digital collaborative communication tools in a program takes patience and can be overwhelming. WBL coordinators have to set up various processes for tools to work effectively for those in the program. The first item when moving to digital is deciding which management system to implement such as Google Docs, Live Binder, discussion boards, and many others. Files and communications must be uploaded, manipulated, controlled, and continually processed in regards to making it work for that particular program. There are many ongoing behind the scenes activities that occur using the digital collaborative communication tools.

Within the upstart of using these tools in the WBL program, it is crucial that the activities match the need of the program. Beth expressed the importance of matching when setting up, “As I said before, we’re trying to create our own local procedures so, when people have certain issues, because some of them are repetitive from year to year.” The programs in WBL operate on a local school level. By making sure that the digital tools align with the needs of the program, it can then be used over multiple years with minor tweaks. Christy stated, “Most of the material or process stays the same from year to year. It is about making sure to post the information in a
workable time pattern for the group.” Students benefit from this ongoing process using the
digital tools, as many of the problems that arise can be corrected for following years.

The upstart process, according to those WBL coordinators interviewed can take an
extended amount of time, sometimes leading to frustration. One element that arose during
analysis was some frustration by students that may have been already in the program or new to
the use of digital tools. Indy expressed, “At first there was a few that kicked and screamed
during the transformation process.” However he transitioned to the positive by stating that “most
students were already comfortable using Google Docs and did not mind sharing or turning in
documents. Yes overall engagement levels have been positive with the use.” Some of the
coordinators shifted and noted the frustration from students to themselves with the timeline.
Alex articulated the importance of making sure that everything needs to be setup properly for the
digital tools to be successful and displayed how this need causes stress. In regards to timing,
Alex shared that “things can run much more smoothly.” However, Alex proclaimed, “This is
only the case if things are setup properly at the beginning. It seems that it would take most
programs two to three years to really get this up and running and actually beneficial to all those
involved.” Many of the coordinators agreed that with proper setup, including the management of
time implementation, positive result can occur with the digital collaborative communication
tools.

In regards to upstarting, the majority of coordinators expressed that taking the time to
start up properly can lead to success. Edward was excitedly descriptive in his connection to
technology and upfront in the process of implementing the digital collaborative communication
tools.
I have always loved technology and it is not something I am afraid of tackling. In fact, I think if you jump in it is a lot easier to make mistakes and then just own up to it. Most students are cool with some setbacks if you are just upfront. I also feel that this gives students a leg up on using technology later at work. If they see you trying then maybe they will also take the plunge.

The statement by Edward took a positive spin towards setup and the obvious need to press forward throughout the entire process. By being upfront and honest with the students about issues the WBL coordinator had in implementing, it may remove some of the frustrations of the students when they begin using the tools. Faye noted, “There are always going to be some hiccups with new technology, but often it is easily overcome.” The majority of participants kept the philosophy of continuing to move forward while correcting to meet the needs of the program. Indy expressed, “Right now, I am just trying to keep everything afloat and running smoothly. I really could see where this could be advantageous.” Indy shared this in a light of continual improvement on the access and use of the digital tools to reach the possible rewards.

**Digital Collaboration Tools Increase Efficiency and Convenience**

WBL coordinators noted that by overcoming these startup steps they are able to increase efficiency and convenience. Each of the WBL coordinators interviewed provided some detail in how the digital collaborative communication tools improved their program for both themselves and students. During analysis, it was fascinating how quickly the participants made a remarkable shift from the difficulties of upstart to the benefits of using the digital tools. Obviously the increase in efficiency and conveniences offered is varied depending on both program and digital tools utilized.
Once the process is in place, the digital tools can begin providing the benefits as initially desired. Indy provided a glimpse into how the proper process can provide overwhelming return. I think it is all about the process. Using digital communication provides everyone access when they are ready to get it. There is no more waiting on a student to pick up a piece of paper or trying to find someone for a quick chat. Now all of this is handled quickly and easily.

Time is a great measure when it comes to benefit of access in communication. Christy discussed how reviewing digital documents “can be done quickly rather than carrying and filling a sheet of paper or presenting at the end of the month.” The processing of documents overall appeared to move quicker for the participants interviewed.

The ability to move away from paper documents appeared to be very advantageous for those interviewed. Dakota noted, “Digital communication gives us one more option to collaborate more effectively. Instead of shuffling a lot of papers around we are able to digitize and share electronically. This is so much more efficient than the way things were run initially.” The electronic sharing of paper seems to have streamlined much of the process when interacting with students. Beth desired to “use a paperless environment as much as possible. It's more convenient.” Indy noted, “Students are able to transfer information and their assignments back and forth to teachers. In work learning we use this completely as it ends a lot of paperwork hassles and provides a post date when things are turned in.” The analysis provided an overpowering desire to move away from paper and move to digital.

The picture of convenience and efficiency was illustrated during analysis in a collective positive manner. Three of the participants commented directly on the positive results. Beth stated, “It is all about convenience when everything is working together”. Herb noted, that
electronic communication “…simplified the process. It made collection of the data much more precise and it eliminated the paperwork hassle.” Edward expressed, “I see a lot of benefits that digital communication can provide.” The other participants were not as explicated but did intertwine these benefits in their response to the interview questions. The connection to both efficiency and convenience was continually intertwined among the themes that emerged from analysis.

**Digital Collaboration Tools Improve the Ability to Update Learning Material and Provide Continuous Access**

Another prominent theme that emerged from the analysis of WBL coordinators interviewed includes the belief that digital collaborative communication tools improve the ability to regularly update learning material and provide continuous access. It was obvious that the ability to update and provide continuous access to the learning material looked different in each program. The difference came about because of the digital tools used and the program management.

The ability to fix and update lesson plans on the fly emerged from the participants as an overall benefit of the digital tool usage. In regards to lesson planning, Alex provided a descriptive example of both the need and ability to change items digitally.

This happens all the time. The digital style seems to really work in this matter. It is nice to fix it in one place and it done across the board. Lessons can be changed on the fly and trust me they have. If something is a complete flop. I have been able to change things midstream. Sometimes something does not work quite right and the ability to change on the go is beneficial. Herb expressed that sometimes the change is as simple as adjusting what is being asked for
within a lesson or discussion. Herb stated that “with the digital media, the first couple of students who replied to something helped me formalize the correct questions to the rest of the students.” Even these simple corrections to lesson can created an improved learning environment.

The ability to make modifications to lessons also increased the ability to collaborate. Two of the participants illustrated how updates improved collaboration. Dakota remarked, “Not only have the teaching lesson plans and all evolved and become more helpful in that collaborative environment, but the method for getting that critical program information has too.” Collaboration is crucial in WBL programs due to the fact that students in the group go to different worksites. Dakota continued, “That really is the heart of that collaborative environment.” In fact, it was brought up by Beth that this collaboration could include the WBL coordinator.

I can always use the information and data we gather in our discussions to add that in as reference or examples for them to use so, they'll know, ongoing, in the future, what to look out for or, what type things other students have experienced in their work environments.

In this case, the coordinator used the discussions to update the lesson plan for the future. Furthermore, students in the program were able to receive direct feedback from the coordinator and later use this material as reference.

Edward continued the discussion of being able to update with ease by using an email from student to spark the process.

I have made a lot of needed fixes to handouts as I am still trying to figure my way through. The students have been a help at correcting or suggesting items.
Sometimes I will get an email from a student or when it is turned in there might be a discussion. Yes. I am able to make adjustments to better the process for both me and students.

Whether it is a change in handout or discussion, the ability to modify lessons was a benefit shared by the entire group of participants interviewed.

In moving from a non-digital format, WBL coordinators appreciated the ability to keep students connected. As with the changes able to be made, the coordinators were able to share the updates with students. Seven of the nine participants interviewed illuminated the desired ability to keep students connected to lessons and material whenever it is needed. Indy simply states, “Using digital communication provides everyone access when they are ready to get it.” Alex promoted the connection, “It seems like the constant connection between the student and the material is very helpful.” Christy demonstrated both the ability for students to have ongoing access and be able to meet a student’s need when ill. Christy noted, “The digital methods kept her up to date with assignments and more importantly still in the system so when she got back she was able to go to work and get started without missing a beat.” Thus, the ability to access the lessons kept the student from getting behind. Students with the use of digital collaborative communication tools now have instance access whenever and wherever they need.

**Digital Collaboration Tools Increase the Availability of a Student Safety Net for Those Struggling or Adapting**

The final prominent theme that emerged from analysis comprises that WBL coordinators feel that digital collaborative communication tools increase the availability of a student safety net
for those struggling or adapting to the new digital skills. Five of the nine participants expressed feedback in this area including needed reminders, having students meet in person or online, keep students on path, and provide an overall coaching if needed.

The ability to remind students to meet, do, or proceed with activities in WBL is constructive for students. Gabby noted that students would sometimes need helpful reminders when it came to assignments. Gabby suggested students to “sign up for the Remind right away, so once I told them to do that, they signed up and they would improve their timeliness of turning in assignments.” This simple ability to send a reminder to a student helps students keep up with everyone else in the program and turn assignment in on time.

Part of the safety net is having the ability to meet with a student that is in need. This can be done in-person or over-the-internet. Faye pointed out that much of her assistance in a special need program is in-person. Faye sets up a schedule where students can come in during three lunch periods with the computers for assistance.

When they come in they meet with me once a week for help on the online portion, as some of my students struggle with what is being looked for, uploading their weekly hour sheets, completing their resume, seeking out references, and just combining the whole process together.

She shared that this availability is crucial so that her students can stay on task and not get frustrated and give up. Furthermore, it supports the transformation between the natural and digital world that is experienced in many WBL programs.

Digital assistance can be offered as well in an online format. This is one of the key benefits to moving to a digital environment in WBL programs. Beth shared how documents explain issues and providing helpful hints that can be placed online for students.
They can go back and scroll through and reflect on stuff or ask questions there. It's documented there, permanent. They can go and search themselves without having to actually talk to a person when they need to. For students that have any type of special issues, we try to make it where everyone can have the information available to them as they need it.

The ability for the student to go back and find the answer within documents already posted was helpful for students in several of the participants programs. Lastly, digital could be a simple helpful email, chat, or video connect according to Herb and several other participants.

Keeping students on the right path was brought up by Edward using the digital tools. This can be done in many ways associated with the tools used. Edward stated, “Just in case a student is going off, I can simply write on the assignment and return it to them without wasting one sheet of paper. The digital helps in making these minor corrections easy to provide to the student.” Again, simple methods can be used to make sure that a student is on the right path. Several interviewed participants noted that this could be done using the discussion boards.

Some students take a little while or may never become completely comfortable with the digital environment. With this in mind, it is important that this ongoing connection of assistance is established early and monitored. Alex acknowledges, “This process might be scary for some students but with a good safety net most students will do fine and those that struggled at the start can be coached.” The WBL coordinator will need to take on the role as coach to help those students overcome obstacles in the digital environment.
Program Tools Used

Beyond the six themes that emerged, the study would be wanting without the further analysis of those tools used by WBL coordinators to implement digital collaborative communication. Some of the WBL coordinators’ perceptions were exhibited through their personal explanations of artifacts. These artifacts and tools brought forth by the participants during the interview provided a collection of tools that can be further examined by other WBL coordinators to decide if it meets the needs of their program. The tools expressed by the participants included Google Docs, Blackboard, Remind101, Live Binder, Email, Text, and various File Sharing programs.

<table>
<thead>
<tr>
<th>Name</th>
<th>Tools Expressed</th>
<th>Artifact Shared</th>
<th>Artifact Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alex</td>
<td>Google Docs</td>
<td>Reflection Timeline - Google Doc</td>
<td>builds once a week and provides thoughts of real world experience</td>
</tr>
<tr>
<td>Beth</td>
<td>Google Docs, Blackboard</td>
<td>Discussion - Blackboard</td>
<td>students have the ability to view and expand previous discussions</td>
</tr>
<tr>
<td>Christy</td>
<td>Blackboard</td>
<td>Class Resume - Graphic Digitized</td>
<td>group resume where students can see the overall knowledge and experience of the group</td>
</tr>
<tr>
<td>Dakota</td>
<td>Google Doc, Remind101, Live Binder</td>
<td>Course Documents - Live Binder</td>
<td>file sharing for mentor, students, an coordinator with timeline of needed documents</td>
</tr>
<tr>
<td>Edward</td>
<td>Email, File Sharing</td>
<td>Chain Discussion - Email</td>
<td>email chain used to broadcast and expand a message and broaden communication</td>
</tr>
<tr>
<td>Faye</td>
<td>File Sharing</td>
<td>Online Portfolio - File Sharing</td>
<td>create a group of files that can be brought together into a portfolio for student use</td>
</tr>
<tr>
<td>Gabby</td>
<td>Google Doc, Remind101</td>
<td>Reminder - Remind101</td>
<td>provides a quick way to message students so that they complete a task or assignment</td>
</tr>
<tr>
<td>Herb</td>
<td>Blackboard, Text</td>
<td>Digital ID - Graphic Digitized</td>
<td>student WBL identification card that can be used to check in and show to others</td>
</tr>
<tr>
<td>Indy</td>
<td>Google Docs</td>
<td>Student Portfolio Timeline - Google Doc</td>
<td>provides a timeline sheet that allows students to share and update</td>
</tr>
</tbody>
</table>

Table 2: Digital Communication Tools. * Denotes names have been changed to protect identity.

Each participant chose a tool that matched their own personal program. According to the majority of those interviewed, Google Docs has come on strong with both the sharing of
assignments, building of portfolios, and presentations. Both Alex and Indy used Google Docs, building a timeline for reflection and student portfolios. Those that used this tool remarked how students always had access to build and share files together.

The ability to file share was extremely important for the WBL programs and went beyond the Google Docs tool. Files had to be shared among the WBL coordinator, students, and worksite mentors. Dakota, Edward, and Faye mentioned file sharing while discussing their perceptions of digital collaborative communication tools. Dakota named another file sharing program, while still using Google Docs, named Live Binder. She noted that this allowed access to the needed documents for those tied to the program. Faye shared an online portfolio for her artifact and discussed how the grouping of files assisted students in building their portfolios.

Other tools expressed included Blackboard, Remind101, email, and text. Blackboard was specifically mentioned by Beth, Christy, and Herb mostly in the context of being able to create live and interactive discussions. Remind101 is an app brought forth by Dakota and Gabby as a quick way to message students so that they could complete tasks or assignments. Lastly, email and text always remained an option with either a way to broadcast a message or blast a speedy message as noted by Edward and Herb.

These various tools used by the participants were ever-changing as new ones are constantly being developed. The majority of those interviewed had a positive perception on the use of tools. Those that seemed comfortable with technology did not seem to mind the changes that were needed when going to a new or updated tool. Most of the participants jumped to the next tool while a few wanted to delay until it was a more permanent fixture in education. Understandably, all participants wanted to make sure that the tool would benefit the overall program once in place.
Summary

In this chapter, findings from transcribed interviews were analyzed. Six major themes were identified when it came to the use of digital collaboration tools in WBL programs: promote ongoing student portfolio creation that aligns with work force skills, amplify student sharing and discussion capabilities, require patience to provided beneficial results, increase efficiency and convenience, improve the ability to regularly update learning material and provide continuous access, and increase the availability of a student safety net for those struggling or adapting to the new digital skills. Focus also included the various tools that were used in regards to those major themes identified. Chapter 5 discusses these emergent themes in relation to the major findings, theoretical framework, and literature review.
Chapter Five: Discussion of Research Findings

The purpose of this research study was to explore the application of digital collaborative communication in regards to the overall educational experience in the WBL program. Coordinator perceptions explored included the types of digital collaboration tools, practices of integration, and role served in a WBL program utilizing the Community of Inquiry (CoI) framework. The overall research question guiding this inquiry was: What are the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ educational experience? The following sub-questions were asked in order to inform this overarching question:

1. How do WBL coordinators use digital collaborative communication tools to support communication?
2. How do WBL coordinators use digital collaborative communication tools to support learning?
3. How do WBL coordinators use digital collaborative communication tools to support teaching?

This basic interpretive qualitative study provided opportunity for the researcher in further “understanding how participants make meaning of a situation or phenomenon” (Merriam, 2002, p. 6). Therefore, the application of digital collaborative communication in regards to the overall educational experience in the WBL program was further explored through the interpreted themes shared by the voices of participants interviewed (Creswell, 2013).

Participants included nine WBL coordinators from the same school system. The data collected was closely analyzed to bring forward findings in regards to the use of digital tools in a
WBL program. The following discussions are based upon the foundations of the study in relation to the major findings, theoretical framework, and literature review.

**Discussion of Major Findings**

A couple of major findings in relation to digital collaborative communication in WBL programs were discovered within the thoughts and sharing of the nine participants of this research study. Overall, the WBL coordinators painted a positive light on using these digital tools in their program. The participants did note however that startup of using these tools took effort and patience both in investigation and setup. Pertaining to this positive connection, those interviewed brought up the following major themes: promoted ongoing student portfolio creation that aligns with work force skills, amplified student sharing and discussion capabilities, increased efficiency and convenience, improved ability to regularly update learning material and provided continuous access, and increased ability of a student safety net for those struggling or adapting to the new digital skills. These finding correlate directly to the overall educational experience in the WBL program.

One prominent outcome from the group of participants in the study was the increased connection to work force skills. The career technology education ongoing commitment to training students for emerging careers of the future was promoted (Partnership for 21st Century Skills, 2004). The WBL coordinators as a whole established a connection between the school and the worksites the students visited. The use of digital collaboration communication tools increased this connection by bridging the two groups. The students benefited from this bridging as more workplace opportunities and sharing of practices emerged. Thus, the school had an increased number of job sites to send students and the onsite mentor had a better understanding of the process that was required.
The participants focused quite a bit on the creation of portfolios in electronic format. In link to these work force skills, the portfolios formed a catalog of documented skills that the student could share with other potential employers. The student’s online portfolio was developed during the entire experience both documenting and illustrating skills acquired. Those interviewed expressed how having the document throughout the students career experience was an excellent way to show growth. Furthermore, it provided a way for the WBL coordinator to find out what may be lacking and what to improve upon the following year. The portfolio in electronic form cleaned up the mess of papers and provided a guide for students to produce a finished product to share. Lastly, the adoption of the digital portfolio furnished the students in the program an opportunity to review their own path and growth. This self-review encouraged students to think about their skill set in the selected career field.

The amplification of student sharing and discussion capabilities was another finding discovered during analysis. The sharing methods go beyond the production and display of portfolios. The WBL coordinators expressed that this is where students tie the job experience to knowledge that was initially learned in the classroom. The amplification, according to participants was primarily due to file sharing and discussion board activities. The ability for students to move files back and forth and share it with the WBL coordinator and other students was extremely beneficial. The process permitted all interested parties to provide feedback and guidance. Discussion boards, through electronic communication, provided a way for students to describe what was happening on their jobsite, answer questions, and learn from others. The avenues for students to share and discuss greatly expanded as more digital collaborative communication tools became available.
These digital activities promoted learning to the next level for students whether working at creating portfolios or continuing online discussions. This crucial element of learning was established through the promotion of reflection and social interaction. This evidence of how digital tools promote learning for students can be found during the utilization of the following:

- **Portfolio** – The creation of a digital portfolio brought the learning of job skills to a higher level. With the absence of shuffling papers, students were able to focus their learning on what occurred in the workplace. The students documented much more than just their hours worked. Students documented the activities that occurred in the workplace. More importantly than this documentation, they were able to focus on their individual skills that were developed while working. While the portfolio was being created, an evidence of growth in learning was established that the student could reflect upon. This reflective piece established a platform that the student learner could use to discover strengths and deficiencies.

- **Student discussions** – Student discussions occurred beyond face-to-face when using the digital tools. The establishment of a social group in an online format allowed discussions to transform over the entire WBL experience for students. Students in this online discussion group had the ability to answer questions in direct alignment with skills being learned. As an example, the WBL coordinator would post a question. Students would then jump on and answer it in direct connection to their workplace. This would now become a discussion board in which other students could respond bringing together a shared learning environment. Several participants interviewed noted a next step where they brought in a piece from the worksite mentors. In this final step, students would hear
from those mentors providing another point of view. Some of those discussions included proper work attire, issues in the office such as filing, and other work related items.

- File sharing and looping methods – Participants interviewed spoke fondly of the ability to share files quickly and easily. This sharing of files could pass swiftly between WBL coordinators, students, and worksite mentors. This ability to share easily brought about a type of looping method when it came to working with assignments. In this looping method, assignments that were turned in was no longer an end point. Student learning was elevated by this looping method as now when an assignment was turned in, feedback was given on how to improve. Furthermore, the assignment could then be shared after corrections with the class. This created a social atmosphere where other students could comment and provide suggestions. According to participants, this extra element of interaction brought forth a sense of excitement to the assignments and a greater depth of learned descriptions.

- Student support- The CoI framework centers on the evidence of the overall educational experience. Part of this experience is the social interaction that occurs while in the WBL program. According to the participants, students tend to form a type of support group where learning can be shared. This group is operational throughout the WBL course assisting, cheering, and part of the overall learning process. Students no longer go to the worksite and internalize the happenings that occur alone. Today, with the advantage of digital tools, students can share their experiences and learn from others that may have or are going through the same matters. This evidence of learning can then be monitored through the social interactions that develops using these digital tools.
It was clear that programs increased in efficiency and convenience when using the digital tools within the WBL program. Reviewing of student documents was much easier for WBL coordinators thus speeding up feedback. The ability to get feedback quickly to the students provided a way for WBL coordinators to steer students in the right direction. Furthermore, if there were any issues in documentation, it could be corrected more quickly keeping everyone on track. For those participants that fully adopted the digital tools, they spoke of the advantages of moving away from paper documents. Those WBL coordinators expressed the ease in transferring and receiving information to both students and jobsite mentors. In fact, the electronic capabilities tended to streamline much of the processes that are crucial to the functions of a WBL program.

The activities of WBL programs were extremely dynamic. The WBL coordinator participants conveyed this throughout the interview especially due to the varied nature of students and worksite choices. Furthermore, several participants expressed that due to guidelines brought forth by the state and local government, sometimes the process must be changed immediately. The use of file management systems and sharing tools has brought about the ability to change learning material on the fly. The ability to fix and update lesson plans is a benefit for all those connected to the WBL program as documents stay current and can be edited to remove errors. This ability to keep items current and accurate truly assists in overall program management for WBL coordinators. Discussion boards are also an item that can be updated to either expand or redirect. Part of this connection includes the ability to provide continuous access. By using these digital tools, students are able to access the lessons continuously. Often times, the student can even access while updates and corrections are being made.
The participants in the study expressed the need in having a student safety net available for students that are struggling in the program or having a hard time adapting to the new digital skills. Either way, the participants shared that the digital collaborative communication tools increased the availability of this student safety net. Several noted that the safety net was now available 24/7 when using these digital tools. The safety net ranged from a simple reminder to students about an assignment to ongoing assistance with developing an online portfolio. It was noted that some students took a while to get on board with the digital tools and needed help through monitoring and redirection. It was expressed by participants that the digital tools provided the capability for the WBL coordinator and all students to work together overcoming obstacles that may come to the forefront in a WBL program.

Of course, there are some drawbacks that were taken note when participants in the research study shared their perceptions. One striking finding during analysis was the patience needed to upstart digital collaborative communication tools in a WBL program. WBL coordinators had to select the best tool in relation to the program. This can be a hassle with the number of file sharing programs, reminder apps, or discussion tools. Once the digital tool is selected, files need to be uploaded, manipulated, controlled, and continually processed. According to participants, it is crucial that the time is taken to make sure that all functions are intertwined properly. The participants overall were upbeat, often expressing the fact that the results were positive once the entire process was completed.

**Discussion of Findings in Relation to Theoretical Framework**

The Community of Inquiry (CoI) framework was used as a theoretical frame to guide this study. WBL programs do not occur in a vacuum and requires a community in which a student can participate and connect educational principles. In a study that explores both the tools of
communication technology and the social aspects of work based learning beyond face-to-face, it will be important to make sure that it benefits the overall educational experience. The CoI framework promotes the examination of the three elements including: social reflection (communication), cognitive exploration of work-related curriculum in a real-world environment (work based learning), and teaching presence within technological structure and process (facilitating collaborative technologies).

In context to the CoI framework, the overall educational experience in work based learning is balanced on the social, cognitive, and teaching presence (Garrison et al., 2000). Social is concerned with a communication dialogue that occurs between all stakeholders in the program including WBL coordinators, students, teachers, parents, and worksite managers. Cognitive supports the exploration of learning in work based learning by connecting curriculum and ideas. Lastly, the teaching presence facilitates these occurrences through instructional technologies and guidance. By interviewing the nine WBL coordinators, the overall educational experience, interconnected by climate, content, and supporting discourse which all tie into student, WBL coordinator, and job site environmental interactions was examined.

**Communication.** The CoI framework’s first element includes the components of social reflection (communication). The evidence of improved communication was illustrated throughout the perceptions provided by those interviewed. The activity of communication was expanded by the digital collaborative communication tools in a variety of ways. Most strikingly, the ability to create an environment where WBL coordinators, students, and occasionally worksite mentors could share in real time was established. Coordinators provided the desire to create such a setting using discussion boards or some other sharing platform. Sharing and discussion practices are crucial when it comes to the WBL program. This practice provides an
opportunity for students to explore their personal progress and have the ability to learn from others.

Another aspect of growth that was described by interview participants was the ability to create a looping methodology. This ability to communicate in a looping manner greatly improved the student experience. Students were able to now see the development and transitions when it came to discussions. Furthermore, participants described how student assignments were also added to the looping mix. Students no longer just turned in assignments and waited for the results. The process of assignments became more active, the results were now just a start rather than the finished product. Students now would return or share with updates and then the assignment would continue to grow as time moved forward in an active manner. The assignment using this looping communication becomes a documentation of growth for the overall experience.

The ability to perform file movement and sharing with ease using the digital collaborative communication tools was an advantage. A majority of the WBL coordinators spoke directly about the ability to share and move files between themselves, the students, and worksite mentors. This ability is extremely beneficial as much of the communication is done through this file sharing. Much of the communication that is required includes information that needs to be filled in by either the student or worksite mentor. Information such as job skills learned, hours worked, progress completed and others are entered into these various files and sent back to the coordinator. The files go beyond just a basic Microsoft Word document and have become much more active with the use of Google Docs where several can enter information and update at the same time.
The positive elements of connectedness was expressed by those that participated in the study. Communication expands as people are connected in the WBL program. The ability to be connected to all stakeholders in a program is highly beneficial. The digital collaborative communication tools keep the WBL coordinator, students, and jobsite mentors in step. Students have an environment that encourages open dialogue which creates a strong, interconnected learning community. This connection stimulates the team as they work through the tasks assigned in the WBL program.

**Work based learning.** The second element of the CoI framework includes the cognitive exploration of work-related curriculum in a real-world environment (work based learning). The WBL program is tied directly into learning job related skills that can be used when a student enters a career field. When starting a career, it is important to be able to convey the knowledge and abilities to a potential employer. Many of the WBL programs require students to produce a portfolio. With the advent of digital tools, WBL coordinators have expanded the portfolio to an electronic/online activity. The participants expressed that by going digital, it has promoted the practice of student created portfolios. Portfolios in connection to careers produce a strong illustration for students to share that aligns to work force skills acquired in the program.

Continuing the discussion of portfolios, employers are able to review these digital student portfolios. The portfolio can serve as an advertisement for the student’s learned skills and accomplishments. Moreover, it show the progress and growth of the student when it comes to acquired skills. Participants interviewed in the study described how they often put out a calendar, much like businesses, that describes what is required by a certain date. This moves the responsibility of completing to the student. This self-management skill is crucial in career education as it encourages the student to take charge of their overall participation.
One element of the WBL program is to have a student experience a jobsite that is specialized to the student. This specialized involvement means that the job aligns with the student. With the arrival of digital tools, WBL coordinators expressed that they are now able to share possible openings with students more readily. The WBL coordinator can post information from a possible jobsite and swiftly share it with students. With this procedure, students have the opportunity to pick places that closely align with their desired careers. It was noted by several WBL coordinators that when students choose, it is much more likely to succeed in work based learning.

**Teaching.** The third part of the CoI framework focuses on teaching presence within technological structure and process (facilitating collaborative technologies/teaching). WBL coordinators are typically in the teaching role known as facilitator. This is not a class where a teacher stands in front of the classroom and disseminates their knowledge. WBL coordinators have the students proceed through career skills and act in the role of facilitator making sure that learning opportunities are available. As an active facilitator, curriculum must be continually updated and expanded to meet the needs of the WBL program. The participants shared how digital tools permitted updating the learning material with ease. Assignments, documents, and discussions can be altered, sometimes in real-time, to update the lesson. The ability to change rapidly provides a way for students to receive the most relevant education desired.

WBL programs have students at many different stages of development and the need for an ongoing safety net is required. The safety net, according to the participants had an extreme range from a simple reminder to full assistance throughout the digital portfolio. The ability to send a quick note or do a video-conference respectively can be accomplished using the digital collaborative communication tools. The digital tools used to help varied from one program to
another. Nevertheless, the WBL coordinator used what they believed best for the needs of their program and teaching style.

An important skill in teaching is the ability to make connections with the student. In WBL programs, this can be difficult as students do not come together as a class often during a year. Thus, the ability to have continuous connection through access can benefit greatly. With the adoption of the digital collaborative communication tools used, student can have 24/7 access to the course. The WBL coordinators that participated noted how they appreciated the ability to keep students connected. The teaching experience was improved for students as they are able to get assistance, information, or share when ready.

**Discussion of Findings in Relation to the Literature Review**

During the literature review, several overarching themes emerged when examining communication, learning, and teaching in a WBL program: creativity/self-expression, engagement/excitement, group learning/reflection, overcoming barriers, student centered, mentorship, and concept connection/research interest. The literature review in connection to the CoI framework assisted in the development of interview questions which the participants were asked. The WBL coordinator perceptions were captured and analyzed in relation to the themes that emerged from the literature review.

**Creativity/self-expression.** The ability to create a creative learning environment where students are able to self-express can be beneficial. Thomas and Pamela (2015), suggested that digital communication promotes creativity. Several of the participants noted this sense of self-expression and creativity when it came to the creation of digital portfolios. The accounts of ways, methods, and designs were as different as the students when described by the participants.
One of the participants, Christy, was encouraged by an imaginative class resume that was put together by students and digitized as a graphic to share.

**Engagement/excitement.** Engaging students and encouraging excitement was an inspiring theme that came about from the literature review. Beatty (2004) expressed that this element is “the most powerful tool for changing students’ attitudes about learning” and can improve participation (p. 11). Herb brought forth the most significant example as he discussed the sense of novelty when using digital collaborative communication tools. The students in the WBL program were using tools that others in the school building had no access. Participants in the study regularly noted how many of the students in the program were excited about the use of the digital tools.

**Group learning/reflection.** Students in the WBL program are typically on their own as they progress through their internship. There are times when students come together to share and learn. When this happens, it is extremely important that it is successful otherwise communication will suffer among the group. Anders (2016) points out that collaboration can create an inclusive learning environment. Several of the participants in the study demonstrated this type of activity through the use of discussion boards. Other participants, used file sharing programs where the students shared their work. The digital tools provided another avenue for the group to share what they learned and reflect on growth that occurred in the WBL program.

**Overcoming barriers.** Learning can be severely hampered by barriers that pop up in a student’s life. Aksal (2009) expressed that online learning can assist in overcoming the barriers. One major theme that paralleled overcoming barriers was the ability to create a safety net for students. Faye assists her special needs students using every tool available to her. Sometimes the safety net is established in-person or over-the-internet. Either way, the objective is to create
an atmosphere where the student can achieve their goals. Beth promoted the ability to overcome barriers using digital assistance. In the case of using digital assistance, she creates documents that can be shared electronically explain procedures or providing examples.

**Student centered.** Gonzales and Young (2015) described a flexible learning environment that was centered on the learner as most beneficial when working towards career readiness. Students in the WBL program will typically decide to focus on the career of their own choice which moves them towards a student centered environment. Several of the participants expressed that the assignments are often created in an open-ended manner so that the student directs the learning process. Christy mentioned that with an assignment like the portfolio, students document their experience in connection to their interest.

**Mentorship.** The practice of mentoring comes about to the student from the WBL coordinator, worksite mentor, and students. Based on the participants, this happens in a hodgepodge of ways in regards to the digital tools used. Duffy (2013) expressed that the feedback needs to be ongoing for a student to have a meaningful experience. The WBL coordinators shared how they were able to provide mentorship the majority of the time. Basically, the focus was the ability to immediately provide feedback and guidance. When it came to worksite mentors, most of the activity occurred on the jobsite where the internship took place. Lastly, the students also would jump in being mentors to other students whether it was about technology issues or happenings at an internship.

**Concept connection/research interest.** Research and concept connection for students in the WBL program more than likely aligns with the career interest of the student. Gordon, Booth, and Bywater (2010) encourage research in connection to personal career growth. Beth encourages the students to take time and research the company so that the student will be
comfortable in the experience. Dakota suggested to students that they explore skills within job titles using websites like Monster. Connecting student research to career goals provides an opportunity for meaningful job skill growth within that student.

**Limitations**

Designed as a basic qualitative study, interviews were an integral part of the research strategy. The participants interviewed in this study were from the same school district located in north Georgia and are practicing WBL coordinators from various high schools. Transferability might be limited due to targeted sample size of those perceptions collected and geographic location. Lastly, another limitation might include the time-boundness of the study. The study was focused on capturing WBL coordinator perceptions for the 2016 school year.

**Implications for Educational Practice**

**Scholarly significance.** The overall goal for this study was to commence a dialogue about the use of digital collaborative communication tools in WBL programs. By choosing a basic interpretive qualitative study, it required me to focus on the voices of those interviewed while setting aside my beliefs. By analyzing the perceptions of the WBL coordinators interviewed, a clearer image that these tools have in enhancing the student’s educational experience was illustrated. These perceptions draw conclusions about how digital collaborative communication tools support communication, learning, and teaching. Based on the nine WBL coordinator responses, it is evident that this research is necessary to improve the understanding between these use of these digital tools and the educational experience in a WBL program.

WBL coordinators in the field need additional research-based practices to support the students in their programs. The selection of digital collaborative communication tools is a complex process as it is essential to match the needs of the WBL program. When writing up the
findings discovered in the study, the quotations illustrated that many WBL coordinators are discovering and choosing the digital tools based on trial and error. It is hoped that this study will stimulate additional research in the area to improve the chance of successful selection when moving forward with digital collaborative communication tools in a WBL program.

Finally, it is desired that my work may have significance for the scholarly community in the use of a basic interpretive qualitative study. Merriam (2009), states that this type of research allows researchers to examine these practices within the context in which it occurs. The basic interpretive qualitative study allows investigation of complex happenings in areas that are fluid like the uses and implementation of digital tools. This type of research according to Merriam (2009), expresses that qualitative research attempts “understanding how people construct their worlds, and what meaning they attribute to their experiences” (p. 5). The WBL coordinators shared methods that happen in their programs during the interviews to benefit the community of WBL programs.

**Practitioner significance.** This research was focused on the perceptions of high school WBL coordinators about digital collaborative communication tools in enhancing student’s educational experience. Though this research study involved only nine WBL coordinators from one school system, it assisted me in understanding how these digital tools support communication, teaching, and learning. The transition to a program that utilizes digital tools in this manner is complex and fluid. Understandably, by analyzing the perceptions of those interviewed, it permitted me to see where issues may arise when implementing such a process.

In WBL programs, the curriculum is student centered based on their area of study. As more digital tools become available, it will be important to make sure that it is a good fit before executing. Based on the study, there is a time period where this upstart can be frustrating. A
take away from this study is that while implementing these new tools, I should be conscious of the fact that it can be equally exasperating for the students. The study pointed out that it is essential to find the positive implementation and use that digital tool for that part of the WBL program. Lastly, it is important to be open to other opportunities that might arise in implementation such digital tools benefiting the student experience.

**Areas for Future Research**

When starting this research, I noticed that there was an array of digital collaborative communication tools that were being used by various WBL coordinators. Unfortunately, there was no particular guide on which one to use or professional development to assist in the various choices. Furthermore, there was very little research in the area as most focused on either career technology education, work based learning, or a variety of digital tools used in communication. The combination of the three regrettably was very lacking in connection when it came to the research landscape. As mentioned earlier, this research study is hopefully the start of a dialogue when it comes to the digital collaborative communication tools utilize in WBL programs. With this initial study in mind, I believe that further research would be beneficial:

- A best practices study would be highly beneficial for WBL coordinators. In this particular case, another general qualitative study could focus on those coordinators that have put these digital tools into practice over several years. This type of research could provide a catalogue of ways to implement digital collaborative communication tools successfully based on the experiences of those coordinators.

- Another beneficial research study would be a case study focused on a particular school that utilizes digital collaborative communication tools in their WBL program. This particular method would bring in the WBL coordinator and students in a single program...
to examine the process of using such digital tools. By opening up the flow of perceptions from students, it will be possible to focus closer on the student’s educational experience from their point of view.

- Additionally, a study that focuses on overcoming the difficulties of digital collaborative communication tools upstart in WBL programs would be valuable. A major theme that emerged from this study included the belief that the upstart in a program took patience. It would be interesting to focus on what produces the difficulties and how it was overcome. By understanding this gap from difficulties to success, it could be highly beneficial for those practicing in the field in reaching success.

**Action Plan**

This research in the field of work based learning and the digital collaborative communication tools implementation is seen as a start. I hope to further investigate the field as expressed in future research to assist WBL coordinators in their journey and improve the experience of students in the WBL program. I plan to work with the state of Georgia in identifying potential schools systems to focus thus permitting this type of research in work based learning to progress further.

There is an obvious need in professional development for those in the work based learning program. I plan to add a training session for WBL coordinators that aligns with The Savannah Experience (a training program for WBL coordinators in experiential experiences) that I established several years ago. This training session will focus on the digital tools that were discovered and used by WBL coordinators from this study. This training session will hopefully be a catalyst for the other potential research identified within future research plans. Professional
development is a great way to get feedback and expand this initial research based on the practices of WBL coordinators in the field.

**Conclusion**

Several years ago, before beginning the research project I decided to look into the ways in which students were communicating in their career technology courses. Over time, as my participation in work based learning increased, I wondered of better ways in which students could receive and transmit communication in the WBL program. Later, this curiosity was fine tuned into discovering the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ education experience. Lastly, with the input of the CoI framework and helpful advice, I focused on how these digital tools support communication, learning, and teaching. These three supports influence the students overall educational experience in WBL programs.

Using a basic interpretive qualitative study, I discovered the following themes that aligned with the overall research question guiding this study: What are the perceptions of high school work based learning coordinator about digital collaborative communication tools in enhancing students’ educational experience? :

- Promotion of ongoing student portfolio creation that aligns with work force skills
- Amplified student sharing and discussion capabilities
- Upstart in a program took patience and provided beneficial results
- Increased efficiency and convenience
- Improved the ability to regularly update learning material and provide continuous access
- Increased the availability of a student safety net for those struggling or adapting to the new digital skills
This research project reinforced many of my presumptions going into the study. However, I was taken by surprise by the amount of patience it took for a WBL program to implement these digital tools. The change with digital tools for collaborative communication is quite dramatic for many WBL coordinators. This was especially true for several of the participants that had been teaching for a while in work based learning. Additionally, some of the newer participants interviewed voiced that it was important to take the time to implement the digital collaborative communication tools to succeed. While there may be some hiccups at making sure that these digital tools match the WBL program, it is obvious that it has intertwined itself into the curriculum. This study may help in the overall appreciation of this balance of digital collaborative communication tools in enhancing students’ educational experience. While this study provides an initial step acquiring the perceptions from WBL coordinators, there are other avenues of research that can certainly impact students in the WBL programs when it comes to digital collaborative communication tools.
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EDUCAUSE Center for Applied Research.


doi:10.1111/j.1467-8535.2012.01346.x


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Appendices

Appendix A: Data Sheet Interview Protocol and Questions

Central: What are the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ educational experience?

Interview (45-55 min):

Demographics & Consent
- Introduction of myself and study to the participant.
- Review consent form and have participants sign it.
- Describe current position/ role/ grade level taught.
- How many years in education (teaching/WBL coordinator)?
- Level of education?
- Did you participate as a student in a work based learning program/internship/apprenticeship?
- How many students are currently in the WBL program?

Research Questions/Debrief

<table>
<thead>
<tr>
<th>Sub-Question 1: How do WBL coordinators use digital collaborative communication tools to support communication?</th>
<th>Interview Questions</th>
<th>Literature</th>
</tr>
</thead>
</table>
| 1. Can you describe a situation when using digital collaborative communication tools (DCCT) - such as blackboard, google docs, etc. - provided an opportunity for students to express or present information in different ways than non-digital or two-way dialogue methods? | 1. Thomas & Pamela (2015)  
3. Anders (2016)  
4. Pifarre, Marti, Guijosa (2014) | 1. Can you tell me about contribution and engagement levels when using DCCT versus other types of communication methods?  
2. Can you give an example how students collaborated or worked together using these DCCTs vs other method(s)?  
3. Describe what group reflection – connecting WBL coordinators, worksite mentors, and students sharing information - looks like in a WBL learning community. |
| Sub-Question 2: How do WBL coordinators use digital collaborative communication tools to support learning? | 1. Can you tell me about a time when these DCCTs helped bridge the learning gap or assist in overcoming a barrier vs other method(s)?  
2. Describe an example of how DCCTs can assist in responding to a student’s need or intervention.  
3. What does personalized learning look like in a WBL program that utilizes DCCTs?  
4. Can you describe how ongoing mentoring feedback works using DCCTs in the WBL program? - Between WBL coordinators / Students? Between Worksite mentors / students?  
5. How do students reflect about the worksite and career skills learned?  
3. Gonzales & Young (2015) and Bennett, Maton, & Kervin (2008)  
| --- | --- | --- |
| Sub-Question 3: How do WBL coordinators use digital collaborative communication tools to support teaching? | 1. Can you tell me about a time when a student connected concepts or personal interests to their WBL course?  
2. Describe a time when lessons/material was adapted in a timely/ongoing manner using DCCT to change the structure or way information is to be shared.  
3. What is an example of research opportunities provided to students in WBL programs using DCCTs?  
4. Can you describe a situation where student comprehension or understanding of the material was influenced by the use of DCCTs? | 1. Rickabaugh & Temple University (2015) and Sobel (2004)  
2. Hammerich (2014)  
• Documents/Artifacts: (bring in an example/copy of digital collaborative communication tool used in WBL to enhance student experience - Examples – blackboard, google docs, remind 101, etc.)
  o Can you share why you chose this particular artifact to bring in? Connection? Anything else?
• Debrief: Is there anything else you would like to share?

**Interview 2: Member-checking / Debrief (15-20 min)**
• Follow up questions (that arose from overall interviews or questions not inquired)
• Debrief: Is there anything else you would like to share?
Appendix B: Signed Informed Consent for Interview Participants

| Northeastern University, College of Professional Studies |
| Investigator Name(s): Principal Investigator: Dr. Kelly Conn |
| Student Researcher: Stephen Allen Wagner |
| Title of Project: Collaborative Communication in Work Based Learning Programs |

Informed Consent to Participate in a Research Study
We are inviting you to take part in a research study. This form will tell you about the study, but the researcher will explain it to you first. You may ask this person any questions that you have. When you are ready to make a decision, you may tell the researcher if you want to participate or not. You are not required to participate if you do not want to. If you decide to participate, the researcher will ask you to sign this statement and will give you a copy to keep for your records.

Why am I being asked to take part in this research study?
You are being asked to participate in this study because you are a practicing Work Based Learning Coordinator.

Why is this research study being done?
The purpose of this research is to explore the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ educational experience. At this time, there is a scarce amount of research when it comes to using digital collaboration tools in a work based learning program. Our goal is to gain better understanding of how WBL coordinators use digital collaborative communication tools to support communication, learning, and teaching.

What will I be asked to do?
If you choose to participate in this study, the researcher will ask for your participation in individual interviews. It is also requested that participants bring in an artifact that exemplifies a digital communication tool used in the work based learning program to describe.

Where will this take place and how much of my time will it take?
Should you partake in this study, you will participate in two interviews in person, no longer than two hours total during the months of October-December at a time and place of your choice. The researcher will contact you via e-mail to arrange a convenient time and location for interviews.

Will there be any risk or discomfort to me?
There are no foreseeable risks or discomfort involved in taking part in this study. Participation in this study is voluntary. During the study, you can skip over any particular question and you can respond to any question as little or as much as you want. All responses will be kept confidential, including participants’ names, schools, and districts.

Will I benefit by being in this research?
There will be no direct benefit to you for taking part in this study. However, the information learned from this study may help impact future implementation of digital collaborative communication tools in work based learning programs.
Who will see the information about me?
You part in this study will be confidential. Only the researchers of this study will see the information about you. No reports or publications will use information that can identify you in any way. All audio recordings will be held in a secured location and will be destroyed after data analysis.

Can I stop my participation in this study?
You are not required to participate in this study. Your participation in this researcher is completely voluntary. At any time during the study, you may refuse to answer questions or end your participation.

Who can I contact if I have questions or concerns?

<table>
<thead>
<tr>
<th>Stephen Wagner</th>
<th>Dr. Kelley Conn - Overseeing Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Researcher</td>
<td>Principal Investigator</td>
</tr>
<tr>
<td>College of Professional Studies</td>
<td>College of Professional Studies</td>
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<tr>
<td>Northeastern University</td>
<td>Northeastern University</td>
</tr>
<tr>
<td>Email: <a href="mailto:wagner.st@husky.neu.edu">wagner.st@husky.neu.edu</a></td>
<td>Email: <a href="mailto:k.conn@neu.edu">k.conn@neu.edu</a></td>
</tr>
</tbody>
</table>

Whom can I contact about my rights as a participant?
If you have any questions about your rights as a participant, you may contact Nan C. Regina, Director, Human Subject Research Protection, 960 Renaissance Park, Northeastern University Boston, MA 02115 tel. 617-373-4588, email irb@neu.edu. You may call anonymously if you wish.

Will I be paid for my participation?
There is no compensation for participation in this study.

Will it cost me anything to participate?
There is no cost to participate.

I have read, understood, and had the opportunity to ask questions regarding this consent form. I fully understand the nature and character of my involvement in this research as a participant and the potential risks. I agree to participate in this study on a voluntary basis.

__________________________________________  ______________________________
Research Participant (signature)  Date

__________________________________________
Research Participant (printed)

__________________________________________  ______________________________
Researcher who explained the study to the participant above and obtained consent (signature)  Date

__________________________________________
Research Participant (printed)
Appendix C: Recruitment Email

Dear ________________:

My name is Stephen Wagner, a doctoral student in the Education Department in the College of Professional Studies at Northeastern University. I am conducting a study to explore the perceptions of high school work based learning coordinators about digital collaborative communication tools in enhancing students’ educational experience.

You are being asked to participate in this study because you are a practicing Work Based Learning Coordinator. The goal of this research is to gain better understanding of how WBL coordinators use digital collaborative communication tools to support communication, learning, and teaching.

In this study, it is important to explore the perceptions of coordinators in the field. In-person interviews will be conducted with you at a location and time that is most convenient. The interviews will be audio-recorded and will be no longer than two hours total. Your name, school’s name, and district will not be included in the study. Pseudonyms will be used to ensure your privacy in the findings of this study. All audio-recorded interviews will be destroyed after data analysis.

If you are interested in participating in this study, please email me at wagner.st@husky.neu.edu with a telephone number to contact you to further discuss your participation.

Thank you for considering this opportunity to share your practices with me.

Sincerely,

Stephen Wagner, Student Researcher
Appendix D: National Institutes of Health Office of Extramural Research Certificate of Completion for “Protecting Human Research Participants”

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that STEPHEN WAGNER successfully completed the NIH Web-based training course “Protecting Human Research Participants”.

Date of completion: 03/11/2015
Certification Number: 1661106