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A Mixed Methods Examination of Generational Faculty Perceptions When Developing Online Courses

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by

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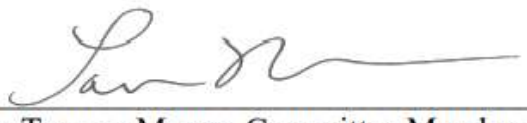	11/06/2020
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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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Abstract

As technology continues to change rapidly, online learning altered higher education. As a result, instructional designers and instructional technologists became more critical in supporting faculty in online course design. Transitioning courses to the online environment created external barriers, such as no training and support, primarily for faculty who never taught online. Instructional designers and instructional technologists helped address external barriers among full-time and adjunct faculty and provided a positive online course development experience. Therefore, the researcher conducted a mixed-methods examination of generational faculty perceptions experienced during online course development at a small Midwestern institution. The researcher investigated a difference between each generation in the following categories: perceptions of technology, ease of use of technology, training and support, and the time needed to learn and develop online courses. Perceptions from each generation depended on years of online course development and the frequency of using an instructional designer. Therefore, the researcher also examined the frequency of training and support received from an instructional designer. Lastly, the researcher wanted to understand the training and support available to different generations to individualize faculty training according to generational learning styles. Examined in the research were 48 administrative, full-time, and adjunct faculty from four schools**:** The School of Professional Studies (SPS), the School of Education (SOE), the School of Arts (SOA), and the School of Business (SOB). Forty-eight participants completed an online survey to help answer six hypotheses and five research questions. The researcher used qualitative and quantitative data analysis techniques to address the six hypotheses and five research questions. As a result, the

researcher failed to reject null hypotheses 1-5 due to the small sample size. The researcher found only a few components of hypothesis 6 rejected the null hypothesis. The qualitative analysis revealed specific themes for each research question, per generation. Lastly, learning characteristics applied to the Silent Generation based on the researcher's experiences and Generation X based on interview observations.

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Chapter One: Introduction

The researcher understood globalization to be an interconnection of diverse ideas and services through collaboration and communication with different cultures worldwide. Globalization allowed for innovation, while rapid technology developments illustrated innovation changed by globalization. In fact, according to Serradell-Lopez, Lara-Navarra, and Casado-Lumbreras (2012), "Globalization is changing the world and affecting higher education characteristics including persons, programs, infrastructure and the students" (p. 44). Technological advances allowed information and communication technologies (ICT) to emerge into online learning in higher education (Alenezi, 2018; Amy & Sixl-Daniell, 2017; Bhati, Mercer, Rankin, & Thomas, 2010). In contrast, e-learning provided students with traditional knowledge in an online environment accessible anytime and anywhere (Abdon, Ninomiya, & Raab, 2007; Amy & Sixl-Daniell, 2017). The advantages of e-learning would lower the cost of students traveling to traditional courses as students accessed online courses within the home environment.

Additionally, e-learning allowed students to control the pace of learning, permitted the flexibility needed for all learning styles, and provided students access to instructor materials (Amy & Sixl-Daniell, 2017). However, technology-enhanced learning came at a high cost to universities and colleges. Laurillard (2007) observed acquiring new digital technology in universities costs more than traditional materials. Furthermore, very few studies on cost-efficient models for digital technology existed. Other costs included the staffing of information technology support for computers, programs, and other technology.

Background of this Study and the Problem

The study was conducted in Saint Charles, Missouri, at a Midwestern university from December 2019 to April 2020 within the following four schools: The School of Education (SOE), School of Professional Studies (SPS), the School of Business (SOB), and the School of Arts (SOA). Each school witnessed a shift from on-ground (traditional) to online course delivery using the Canvas learning management system. For online learning to be like on-ground courses, instructors needed to utilize most, if not all, of the tools in Canvas, minimally, discussions, conferences, assignments, and collaborations.

Moving on-ground courses online resulted in internal and external barriers among faculty and students (Rogers, 2000). The researcher explored the internal barriers faculty faced when switching from on-ground to online. Internal barriers were boundaries controlled by the person, which included the following: a lack of confidence, poor attitudes toward technology, a lack of technical skills, negative perceptions toward technology, resistance to change using technology, and a lack of time needed to deliver courses (Alenezi, 2018; Al-Meajel & Sharadgah, 2018; Kim, 2008, as cited in Al-Shboul, 2013; Allen & Seaman, 2008; Al-Meajel & Sharadgah, 2018; Rogers, 2000). To address internal barriers, universities required highly trained support staff, such as instructional designers. Predominantly, instructional designers provided faculty support for online course development using online platforms and teaching in online environments (Ritzhaupt & Kumar, 2015).

Purpose of the Dissertation

The purpose of the study was for the researcher to conduct a mixed-methods examination of faculty perceptions among those who developed online courses. The researcher compared generational perceptions of technology, ease of use, training, support, and the time needed to learn and develop online courses. Faculty perceptions of technology thrived on generational views on instructional technology used during online course design. Individual perceptions of user-friendly instructional technology concerned each generation during online course design. The perceptions of training and support included generational views on training or support received from an instructional designer during online course design. Faculty perceptions of time needed to learn how to develop online courses included generational views on the time given to learn how to develop an online course.

Additionally, the perceptions of time needed to develop online courses included generational views on the time given to develop an online course. Faculty perceptions from each generation depended on years of online course development and the frequency of using an instructional designer. Therefore, the researcher also examined the frequency of training and support received from an instructional designer.

Rationale

As technological advances continued, online learning fostered change in higher education. Thelin (2017) stated, “Online education is merely the latest in a long succession of teaching innovation . . . in other words, online education is part of the higher education’s heritage” (p. 53). To understand how Thelin’s (2017) statement of online learning became a part of the college heritage, one must understand traditional

classroom learning. Allen, Bourhis, Burrell, and Mabry (2002) and Zhang, Zhao, Zhou, and Nunamaker (2004) defined traditional education as instructor-led, face-to-face learning in the classroom environment. However, traditional education had disadvantages. Zhang et al. (2004) proposed instructor-led courses took away the responsibility and control of the student's learning experience. The same researchers also identified time and location as factors when students decided to attend college. Not only did the student miss an opportunity to pursue a favorable degree due to the scheduled course time, dates, and location, but the college also missed an opportunity to engage with the student.

Rapid changes in technology caused colleges to create more online degree programs for students who were local or distant, and technological advances also allowed students to access education easily. Furthermore, colleges could transition most traditional courses to online, adding to the library of online course degree programs. Lastly, due to the high demands for online learning, enrollment at colleges increased (Gargano & Throop, 2017; Garrison & Kanuka, 2004; Hughes, 2007; Keengwe & Kidd, 2010; Kim & Bonk, 2006; Rovai & Jordan, 2004; Xia, 2015; Zhang et al., 2004).

However, some faculty remained resistant to transition courses to the online environment, primarily if those faculty never taught online. Both Rajasingham (2011) and Jaffee (1998) perceived the faculty as significant for keeping universities mainstream and relevant. Therefore, if universities "undergo significant transformation" (Jaffee, 1998, p. 23), such as teaching online, then the faculty must have been acceptable to any significant transformation. Rajasingham and Jaffee (1998) inspired the researcher to study faculty members who transitioned to courses online to understand faculty

perceptions during online course development. Once the researcher understood faculty perceptions, the results could help instructional designers and instructional technologists to support faculty full time, help faculty who developed online courses and possibly reduce resistance.

Significant transformations occurring in the university would make faculty who struggled with technology resist, so researchers perceived instructional designers and technologists as influential in providing support. In the past, the researcher experienced situations in which adopting new technology in an online environment could be challenging when teachers lacked an instructional technology skillset. Chun et al. (2015) indicated instructional designers and technologists should provide technology workshops and/or extensive one-on-one training. The researcher once conducted workshops and extensive individual training and discovered the experience was helpful to faculty members who struggled to develop online courses. Instructional designers and technologists understood faculty resistance could transpire for several reasons, primarily when uncertainty with technology existed. Instructional designers eased the variability by applying the Technology Acceptance Model (TAM). According to Sutton and DeSantis (2017) and Fathema, Shannon, and Ross (2015), TAM addressed uncertainties with new technology changes during the transition to online learning and measured the acceptance of new technology perceptions generational faculty.

While some researchers, like Kenny, Zhang, Schwier, and Campbell (2005) studied the roles of instructional designers, the researcher wanted to focus on the importance of instructional designers and instructional technologists related to higher education. Understanding the faculty relevance and the researcher's experience as an

instructional technologist would fill the gap in the current literature and highlight the significance of higher education.

The Research Participants

Four schools participated in online course development, 137 potential participants at the Midwestern private university. The exclusion of participants happened within the distribution list collected from each of the four schools, as a few full-time and part-time faculty responded sharing they did not qualify to participate. The qualification to participate in the study meant building online courses within the past two years at the Midwestern university. Overall, a total of 58 participants completed the survey. From these, the researcher removed 10 surveys: one in which the participant did not specify a generation, and nine where the participants did not develop an online course within two years of this study.

Hypotheses

There were six hypotheses for the mixed methods study.

Null Hypothesis 1: There is no difference in faculty perceptions about technology by generation when developing online courses.

Null Hypothesis 2: There is no difference in faculty perceptions by generation about the ease of use of technology when developing online courses.

Null Hypothesis 3: There is no difference in faculty perceptions by generation about the training and support needed to develop online courses.

Null Hypothesis 4: There is no difference in faculty perceptions by generation about the time needed to learn how to develop online courses.

Null Hypothesis 5: There is no difference in faculty perceptions by generation about the time needed to complete the development of online courses.

Null Hypothesis 6: There is no difference between a faculty member's years of experience and the frequency of training and support he or she needed to receive from an instructional designer.

Research Questions

There were five research questions for the mixed methods study.

Research Question 1: How does each generation perceive technology when developing online courses?

Research Question 2: How does each generation perceive the ease of use of technology when developing online courses?

Research Question 3: How does each generation perceive the training and support needed to develop online courses?

Research Question 4: How does each generation perceive the time needed to learn how to develop online courses?

Research Question 5: How does each generation perceive the time needed to complete the development of online courses?

Methodology

The researcher performed a quantitative and qualitative analysis to answer the hypotheses and research questions. The quantitative research included the researcher using questionnaires from five prior published studies measuring technology perceptions, ease of technology use, provided training and support, the time needed for learning, and course development. Furthermore, the studies examined perceptions of technology and

the ease of use when interacting with instructional technology (Hwang, Yang, & Wang, 2013; Karaca, Can, & Yildirim, 2013; Peffer, Bodzin, & Smith, 2013; Teo, 2011). The researcher, an instructional technologist, argued the importance of faculty perceptions and ease of technology when transitioning from on-ground to online courses. The researcher also argued, among full-time and adjunct faculty, student learning and the development of online coursework could be hindered or enhanced by technology perceptions, the ease of technology use, provided training and support, the time needed for learning, and course development. The researcher sought to understand faculty perceptions of the ease of technology used to respond to instructional technology needs appropriately.

The qualitative research included open-ended questions within a forced-choice survey. The participants had the option to be interviewed after completing the survey. The researcher used NVivo12 to code the open-ended questions from the survey and the interviews for common themes. The quantitative research included forced-choice questions within the survey aligned to each hypothesis. The researcher conducted the following statistical analysis on the forced-choice responses from the survey: descriptive statistics, cross-tabulations, Chi-Square test of independence, and Kruskal-Wallis H test.

Definition of Terms

Educational Technology: **"**The study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (Reiser & Dempsey, 2012, p. 4). For the purpose of the study, participants used Canvas and integrations, such as McGraw-Hill and Turnitin to help aid learning in the online environment.

E-Learning: The use of electronics and the internet for learning purposes (Borstorff & Lowe, 2007; Thomas & Cunningham, 2003). For the purpose of the study, examples of E-Learning would be course development for online using Canvas.

Distance Learning: Online courses at a distance, using technology (Garrison & Kanuka, 2004; Hughes, 2007; Keengwe & Kidd, 2010; Rovai & Jordan, 2004; Zhang et al., 2004). For the purpose of the study, participants would be using Canvas to build courses for distant online learning.

Generational birth dates:

- *Silent Generation (Traditional):* Individuals known to be the oldest generation, born between 1925 to 1945 (Collins & Tilson, 2001; Chun et al., 2015). For the purpose of the study, the researcher used 1925–1945 as a generational birth criterion.
- *Baby Boomers:* Individuals born between 1943 to 1964 (Chun et al., 2015). For the purpose of the study, the researcher used 1945–1964 as the generational birth criterion.
- *Generation X:* Individuals born between 1961 to 1980 (Chun et al., 2015). For the purpose of the study, the researcher used 1965 to 1980 as a generational birth criterion.
- *Generation Y (Millennial):* Individuals born between 1981 to the early 1990s (Chun et al., 2015). For the purposed of the study, the researcher used 1980 to 1995 as a generation birth criterion.
- *Generation Z:* Individuals born between 1995 to 2015 (Chun et al., 2015; Schroer, 2008, as cited in Wiedmer, 2015). For the purpose of the study, the

researcher used 1995–2015 as a generational birth criterion.

Instructional Designer: Someone who would "design and develop content, experiences, and other solutions to support the acquisition of new knowledge or skills" (*What Is Instructional Design?* n.d., para. 2).

Instructional Technologist: Instructional technologists focus on "tools or technologies used to aid learning" (Gardner, 2017).

Instructional Technology: "Instructional technology includes practical techniques of instructional delivery that systematically aim for effective learning" (Gagne, 2013, p. 7). Examples of instructional technology ranged "from electronic whiteboards to online courses or even virtual reality classrooms" (LSU Online, 2020, para. 3). At the time of the study, Canvas, used by participants to build online courses, was an example of instructional technology.

Learning Management System (LMS): A web-based or cloud-based software program allowing for the creation and development of content used to enhance the learning experience (Chaubey & Bhattacharya, 2015; Computer-Aided E-Learning Team, 2018). Examples of learning management systems include WebCT, Blackboard, and Canvas. For the purpose of the study, the researcher used Canvas.

On-Ground Classes: For the purpose of the study, the Midwestern private university held courses in a traditional classroom environment. Other terms for on-ground courses are in-seat, face-to-face, in-person, or traditional.

Online Classes: For the purpose of the study, the Canvas LMS environment held online classes at the Midwestern private university.

School of Professional Studies: For the purpose of the study, the Midwestern

private university provided accelerated evening and adult learning classes for adults who attended school at night for both undergraduate and graduate degrees.

Virtual Learning Environment (VLE): "Virtual space that brings technology and content together for e-learning" (Computer Aided E-Learning Team, 2018, para. 7). Examples of virtual spaces at the time of the study included Canvas, WebCT, Blackboard, and Canvas. For the purpose of the study, the researcher used Canvas as a virtual space.

Study Limitations

The researcher could not implement the study while the participants completed online course development in the School of Professional Studies. However, to receive permissions to include the School of Professional Studies, the school's dean requested the researcher conduct data collection from March 1 to March 21. The School of Professional Studies merged with other schools at the Midwestern university, which obstructed the sample size. The merge caused the full-time and adjunct faculty at the School of Professional Studies to leave the university to pursue other duties at other institutions or companies. The instrument used served as a limitation since the researcher spent much time in the field and as an instructional technologist, open-ended questions could have revealed bias. The last limitation was the location and time of interviews. Most interviews were completed by phone except for one face-to-face interview. The researcher conducted interviews in rooms with high traffic and around work hours of the interviewer and the participant.

Furthermore, the researcher's study focused on generational perceptions of technology, ease of use, training and support, and the time needed to learn and develop

online courses. The researcher also included perception as a study limitation since participants' answers could vary, based on surrounding situations out of the researcher's control. Also, surrounding situations could have resulted in participants answering honestly or dishonestly to the survey or interview questions.

Summary

In the experience of an instructional technologist, universities must keep in mind the future of higher education as technological advancements continue. As proposed by the researcher, traditional courses should transfer to online while addressing the following challenges: faculty's intrinsic barriers when moving courses to the online environment with the assistance of an instructional designer, adapting curriculum to new ways of teaching and learning for online courses, and the expectation of technology integration into the student's college education. The researcher perceived the above challenges as essential to address. If the university failed to address the challenges of the faculty, the longevity of the university or college could be at risk. With the future of higher education surrounding the cultural changes of society and COVID-19, "online education is becoming an important long-term strategy for many postsecondary institutions" (Kim & Bonk, 2006, p. 23). The researcher believed online learning could help keep universities mainstream and relevant. Literature found in Chapter Two supported the researcher's reasoning for the study.

Chapter Two: Literature Review

Rapid Changes in Technology Impacting Higher Education

Higher education changed to adapt to new technology, such as cloud computing, video streaming, and other technologies. New technology changes, such as the few mentioned, helped shape the world in communication, collaboration, and innovation. As technological advances continued, online education became a part of "higher education's heritage" (Thelin, 2017, p. 53). New technology changes caused universities to consider transferring courses from traditional to online as online courses allowed for traditional knowledge accessed anytime and anywhere (Abdon et al., 2007; Amy & Six-Daniell, 2017). In Chapter Two, the researcher discussed how universities and colleges experienced challenges with transitioning courses from in-person (traditional) to online, focusing on the following: the importance of online learning, faculty barriers when moving courses to the online environment, the importance of instructional designers and instructional technology in higher education, historical background to be considered, and financial cost to consider. The researcher used literature to support the study.

The Importance of Online Higher Education

Thelin (2017) argued online education would become a part of higher education. The researcher further explored Thelin's (2017) statement to discuss the importance of online learning in higher education through faculty and students. This section highlighted technological advances in promoting online learning through student outreach by creating online learning programs and degrees. The researcher also discussed the increasing demands for online learning and concluded with online learning as an opportunity for students to access education.

Online learning as meaningful. Rapid changes in technology caused universities to create additional online degree programs for students, both local and distant. Furthermore, universities transitioned most traditional courses online, adding to the university's online courses and degree programs. High demands for online learning could possibly enhance enrollment and retention (Gargano & Throop, 2017; Garrison & Kanuka, 2004; Hughes, 2007; Keengwe & Kidd, 2010; Kim & Bonk, 2006; Rovai & Jordan, 2004; Xia, 2015; Zhang et al., 2004).

Online Learning Significance to Faculty. The faculty provided students with guidance and immediate feedback at any time during online courses. Digitally uploaded or updated course materials could be provided to students immediately. Faculty monitored and addressed students' achievements and individual challenges (Ally, 2004). Online educators mediated as students shaped their learning experiences. Lastly, faculty utilized tools to create engaging courses, and some online environments had a traditional-classroom feel (Ally, 2004; Dreher et al., 2009; Gargano & Throop, 2017; Hughes, 2007; Kim & Bonk, 2006).

Online Learning Significance to Students. Design for mainly academic nomads was Online learning. Academic nomads are students with busy schedules who could not enroll in traditional courses due to time and location constraints (Gargano & Throop, 2017). Online learning reduced travel costs due to the accessibility of online courses at home. Online courses, perceived as student-centered, allowed students to control the learning pace and access help at any time. As faculty provided digital course materials, students quickly obtained digital learning materials at any time (Amy & Sixl-Daniell, 2017; Ally, 2004). If designed correctly by faculty, online courses became engaging and

collaborative among the students enrolled (Ally, 2004; Gargano & Throop, 2017; Garrison & Kanuka, 2004; Kim & Bonk, 2006; Zhang et al., 2004).

Historical Background to Consider

The previous section highlighted the importance of online courses to faculty and students. Due to technological advances, online learning was essential to higher education. Thelin (2017) argued online learning was now a part of the college heritage. Universities and colleges needed to change the curriculum since "technology innovation is changing how universities teach, and students learn" (Rajasingham, 2011, p. 1). Universities adapted to new ways of teaching and learning due to technological advances online that fit the needs of today's students. The section below would discuss the origin of traditional classroom learning, online learning, and historical background and learning characteristics of the following generations: Silent (Traditional) Generation, Baby Boomers, Generation X, Generation Y, and Generation Z.

Traditional Classroom Learning

Researchers Allen et al. (2002), and Zhang, Zhao, Zhou, and Nunamaker (2004) defined traditional learning as instructor-led, face-to-face learning in the classroom environment. Faculty and students benefitted from traditional classroom learning. Traditional classrooms allowed the instructor to build relationships with students. Also, traditional classrooms allowed students to receive instant feedback and motivated students to complete the course (Zhang, Zhao, Zhou, and Nunamaker, 2004).

However, traditional learning had disadvantages. Zhang et al. (2004) argued instructor-led courses took away the responsibility and control of the students' learning experience. The researchers also suggested time, distance, and location factors in

students' choice of college. With time, distance, and location as deciding factors, not only did the student miss an opportunity to pursue a fair degree, but the college also missed out on having the student. Lastly, traditional classrooms became expensive to maintain, with new upgrades to classroom overhead projectors, computers, and seating (Laurillard, 2007).

Regardless of the positives and negatives of traditional classrooms, researchers like Dew (2012) believed traditional classrooms are never going away. Dew (2012) argued traditional attendance was relevant because "going to college remains a social experience that is important for many young people" (Dew, 2012, p. 9). Dew (2012) further explained parents and students looked forward to the college experience regardless of the rapid development of online learning, and parents sent their children to college in the hope of experiencing the college life as parents did.

Online Learning

As higher education started with traditional classrooms, online learning began with the World Wide Web. "The invention of the World Wide Web in 1992 made online education increasingly accessible and allowed new pedagogical models to emerge" (Harasim, 2000, p. 42). The virtual learning environments (VLE) were courses held online using web-based software. Web-based software would include chat rooms, discussion boards, calendars, announcements, quizzes, and assignments; available twenty-four hours a day, seven days a week (Brenton, 2008), allowing flexibility and giving students the ability to access course information anytime (Brenton, 2008; Chaubey & Bhattacharya, 2015). Examples of virtual learning environments include: WebCT, Blackboard, and Canvas.

Academic nomads were "parent, bilingual, veteran, part-time student, online student, scholarship awardee, international student, dual citizen, traveling professional" (Gargano & Throop, 2017, p. 919) whom attended school online. Other advantages of online learning include the accessibility of courses and an unlimited amount of academic resources available on the web. Online learning allowed students to collaborate with other peers and provided introverted students with a voice. Online learning was perceived as student/learner-centered, allowing students to take responsibility for their learning (Cloete, 2017; Garrison & Kanuka, 2004; Harasim, 2000). Because online courses perceived as student/learner-centered, faculty served as facilitators and guides for students (Dreher, Reiners, Dreher, & Dreher, 2009). Moreover, students overall tended to do better in online courses than traditional courses because of the advantages. Hannay and Newvine (2006) conducted a study of student perceptions of online learning compared to traditional learning. Hannay and Newvine (2006) reported students preferred online courses over traditional courses due to the following: "higher grades, learned more, instructor materials more useful, and high quality" (p. 7). Lastly, Knoedler (2015) stated the cost of online courses was low. Knoedler's (2015) statement may have been true during the beginning of online learning, yet Knedler's (2015) would change due to drastic changes in technology.

However, self-directed online courses were a turn-off for students who enjoyed the guidance of an instructor, or if a student lacked motivation. Other disadvantages of online learning include being student-learner-centered. Kop (2011) and Xia (2015) argued being student-learner-centered was a disadvantage rather than an advantage because it could hinder the quality of the students' learning experience. Students were

also disappointed in the response time of instructions in online courses. Other online disadvantages were the lack of relationships the faculty had with students, mainly because the student and instructor never met face-to-face. Furthermore, the faculty understood course preparation time took longer than a traditional course. Faculty who used to teaching traditional courses feared teaching online due to fear of technology (Cloete, 2017; Zhang et al., 2004).

Massive Open Online Courses (MOOCs)

Virtual learning environments included Massive Open Online Courses (MOOCs), free, non-credit courses designed online. MOOCs included student engagement using videos, quizzes, and discussions (Xia, 2015). However, universities and colleges could not accept MOOCs or any other non-credited courses because MOOCs were not credited. Nevertheless, MOOCs inspired many universities like the University of Phoenix and other accredited universities to develop online degree programs (Thelin, 2017).

Learning Management Systems

Other forms of online learning development include distance learning, e-learning, and blended learning. Distance learning involved online courses that utilized technology; meanwhile, e-learning was about learning through learning management systems (LMS). According to Choy, Xiao, J., and Iliff (2005), learning management systems were "software packages designed for quality online education" (p. 130), while learning management systems originated in the 1990s (Alenezi, 2018). Better known as "computer-based integrated learning systems" (Becker & Hativa, 1994, p. 5), used as long as the institution had reliable internet access and a robust infrastructure (Alenezi, 2018). As such, learning management systems were used by faculty as an online

teaching method to “improve pedagogy” (Alenezi, 2018, p. 1). Learning management systems were used in higher education institutions globally due to “ubiquity, easiness and accessibility” (Mohsen, 2014, p. 108). The systems allowed for online courses to be student-centered rather than instructor-centered, cost-effective, and allowed for a global reach of students (Bayaga & Alghamdi, 2016; Bhati et al., 2010; Brenton, 2008; Chaubey & Bhattacharya, 2015; O’Flaherty & Phillips, 2015). Most importantly, with an LMS, student learning became digitally assessed and documented (Information Science Reference, as cited in Alenezi, 2018). Examples of learning management systems include Blackboard, Sakai, Moodle (Alenezi, 2018), and Canvas.

Online teaching “improves pedagogy” (Alenezi, 2018, p. 1), due to the functions within the learning management systems that allowed for interaction and collaboration among the students, faculty, and course materials (Alenezi, 2018; Al Naibi, Madarsha, & Ismail, 2015; Bradford, Porciello, Balkon, & Backus, 2007). Functions include assignments, quizzes, grades, emails, and announcements (Al Meajel & Sharadgah, 2018), which improved the student’s learning experience. External tools, such as Turnitin and YouTube, also were integrated into the LMS. Moreover, asynchronous and synchronous lectures used for blended learning, distance learning, and individual and group work. However, learning management systems hindered students’ learning experiences if the functions were not used correctly (Brenton, 2008).

Kennedy (2009) also mentioned closed-source and open-source learning management systems. “Open-source learning management can be modified and developed and is used free of charge” (Alenezi, 2018, p. 3). Examples of open-sourced learning management systems include Moodle, ATutor, and Dokeos (Alenezi, 2018).

Closed-source learning management, owned by private companies, was costly. Examples of closed-source learning management systems include Canvas, Blackboard, and WebCT (Alenezi, 2018). Although learning management systems provided an ideal space for online learning, the LMS did not replace traditional education (Alenezi, 2018).

Generations

The issue of intersecting generations in higher education classrooms generated opportunities for universities and colleges to change how faculty taught, how students learned, and the type of technology utilized. Collins and Tilson (2001) and Walker, Martin, White, Norwood, and Haynie (2006) studied the issue of intersecting generations in higher education classrooms. According to Walker, Martin, White, Elliott, Norwood, Mangum, and Haynie (2006), Collins and Tilson (2001), Chun et al. (2015), and Wiedmer (2015), Baby Boomer and Generation X faculty dominated generational faculty in higher education, while Generation Y was new to the workforce and "5%" (Wiedmer, 2015, p. 52) of the Silent Generation remained in education and the workforce. Generation Z students currently populated college classrooms. Collins and Tilson (2001) and Walker, Martin, White, Norwood, and Haynie (2006) found teaching and learning were concerns for faculty as teaching methodologies needed to adhere to students' individual learning needs. DeBello (1990) described the importance of personalized learning preferences as vital to American education. More importantly, learning may not have occurred if the delivery of information was not conducive to adult students' learning styles (Sims, 1995).

The researcher found Traditional, Baby Boomer, Generation X, and Generation Y faculty members at a Midwestern university were teaching Generation Z students. A

researcher called Generation Z "digital natives" (Horovitz, 2012, as cited in Wiedmer, 2015) who expected technology integration in the college experience (Sutton & DeSantis, 2017). Therefore, adopting new technology in the online environment was essential "to respond to the new expectations of learners" (Rajasingham, 2011, p. 9).

The generation section below? described the following generations, present in higher education classrooms: Silent Generation (Traditionalist), Baby Boomers, Generation X, Generation Y, and Generation Z. The researcher highlighted the literature on the origin, characteristics, learning styles, teaching styles, and technologies of each generation that would help instructional designers best support each generation using instructional technology for online course design.

Silent Generation (Traditionalists). According to research, the Silent Generation, also known as the Traditionalist, was the oldest generation. The Silent Generation was born between 1925 and 1945 and aged between 73 and 118 years. The majority of the members of the Silent Generation were retired, and "5%" (Wiedmer, 2015, p. 52) remained in education and the workforce today (Collins & Tilson, 2001; Chun et al., 2015; Wiedmer, 2015). The Silent Generation experienced the Great Depression, Hitler's invasion of Russia, World War II, the attack on Pearl Harbor, and the Korean War of 1950 (Wiedmer, 2015). Collins and Tilson (2001) and Wiedmer (2015) explained the characteristics of the Silent Generation included non-creativity or non-expression of self, young families, overprotective parents, union laborers, respect for authority, valuing family, non-risk-taking, motivation by money and position, and viewing education as unattainable. The learning styles of the Silent Generation include traditional instructor-led classes and recognized for achievements with certificates or

trophies (Wiedmer, 2015). Lastly, the technologies of the Silent Generation include transatlantic radio signals, stereo phonographs, and the development of computers (Dziuban, Moskal, & Hartman, 2005).

Baby Boomers. Collins and Tilson (2001) and Chun et al. (2015) stated the Baby Boomer generation was born between 1943 and 1964, aged 54–72 years. Baby Boomers were the largest generation born after World War II (Heathfied, as cited in Wiedmer, 2015). According to Collins and Tilson (2001), Baby Boomers were from the era of community spirit, developing high hopes and aspirations, and demanding change. The Baby Boomer generation experienced the Cold War, the threat of Russian nuclear attacks, the Vietnam War, and the assassinations of John F. Kennedy, Robert Kennedy, and Martin Luther King Jr. Baby Boomers also lived during the civil rights and women's rights movements (McIntosh, 2008; Robinson, as cited in Wiedmer, 2015).

The characteristics of the Baby Boomer generation included holding positions of authority and power, being hard workers, committed to personal and professional goals, observing oneself, and being inflexible, independent, and competitive (Collins & Tilson, 2001; Wiedmer, 2015). Like the Silent Generation, Baby Boomers expected to be valued and rewarded for individual achievements. The Baby Boomer generation was the first in families to attend college (Wiedmer, 2015). Characteristics of the Baby Boomer generation included teamwork, discussions, icebreakers, and the use of life experiences as effective teaching strategies (Blevins, 2014). Lastly, technologies of the Baby Boomer generation included PLATO, fax machines, BASIC computer language, and minicomputers (Dziuban, Moskal, & Hartman, 2005).

Generation X. According to Collins and Tilson (2001) and Chun et al. (2015), Generation X was born around 1961 to 1980 and identified as the smallest living generation. The ages of Generation X are about "34 to 54" (Wiedmer, 2015, p. 53) years old. Most Generation X children were born of Baby Boomer parents and experienced broken homes and workaholic parents (Wiedmer, 2015). As a result, Generation X cared for themselves and became more independent; the term "latchkey kids" became prevalent throughout the generation. Generation X also experienced the 1976 Arab oil debacle, the fall of the Berlin Wall, the splitting of the Soviet Union, the introduction of Apple computers, and the AIDS epidemic. Generation X was highly educated due to graduating from high school and college (Robinson, 2012).

Characteristics of Generation X included being independent, self-directed, and disliked being micromanaged (Wiedmer, 2015). Learning characteristics of Generation X included little to no interaction with classmates, and an enjoyable learning environment, hands-on learning, role-playing, and the use of technology (Blevins, 2014). Lastly, the technology usage of Generation X included a Windows keyboard and mouse, UNIX operating system, Intel microprocessor chip, C programming, and PC and Apple computers (Dziuban, Moskal, & Hartman, 2005).

Generation Y (Millennials). Generation Y, also known as millennials, were born between 1981 and the early 1990s, making the generation the most influential group since the Baby Boomer generation (Collins & Tilson, 2001; Chun et al. 2015). The age of Generation Y ranged from 28 to 38 years old. Generation Y grew up during the development of technology such as computers, the internet, and cellular phones and experienced the prison release of Nelson Mandela, the death of Princess Diana, the attack

on the World Trade Center resulting in the war on Iraq, the Columbine High School shooting, Hurricane Katrina, and the Oklahoma City bombing (Wiedmer, 2015).

Additionally, characteristics of Generation Y included being web- and technology-savvy, connected to social media and the community, as well as being less independent. Generation Y's learning characteristics included clear goals and structure, experimenting with assignments, developing projects with a sense of purpose and belonging, and hands-on and group work (Burruss & Popkess, as cited in Blevins, 2014). As Generation Y was highly technology-savvy, sometimes this "hinder [ed] their critical thinking skills and the ability to prioritize roles and responsibilities" (Burruss & Popkess, as cited in Blevins, 2014, p. 60). Lastly, Generation Y's technology included the internet, Windows OS, Macintosh computers, and HTML (Dziuban, Moskal, & Hartman, 2005).

Generation Z. According to Chun et al. (2015) and Schroer (2015, as cited in Wiedmer, 2015), the latest generation was Generation Z, born between 1995 and 2015. The age for Generation Z ranged from about three to 23 years old. Generation Z members also called "Digital Natives" (Horovitz, 2012, as cited in Wiedmer, 2015) as the individuals raised in the digital world surrounded by the internet and cell phones. Members of Generation Z had a 30% shorter attention span than Millennials, and separation from phones became a stressor (Buzzetto-Hollywood, 2018).

According to researcher Renfro (2012, as cited in Chun et al., 2015), the characteristics of Generation Z included being technology-savvy, communicating through technology, and homeschooled. Also, Generation Z interacted with multimedia regularly to obtain answers and instantly connected with others through social media platforms such as Snapchat, Facebook, and Instagram. Generation Z preferred to communicate in

real-time using Skype and FaceTime. Learning characteristics of Generation Z included needing fewer directions, using digital tools, learning visually, and disliking the traditional way of teaching, such as exams and lectures, while enjoying collaborative learning. Lastly, Generation Z's technology included search engines, DVDs, MP3 players, and Google (Dziuban, Moskal, & Hartman, 2005).

Internal and External Barriers to Consider

The previous section highlighted the importance of higher education's history regarding traditional classrooms and the origins of online learning. However, transitioning traditional courses online created new challenges for universities. Considering potential barriers was essential for universities that wanted to implement online teaching and learning methodologies. Rogers (2000) mentioned two types of obstacles: internal and external. The next section included internal and external barriers for faculty and students when moving education online.

Internal Barriers

Internal barriers defined as boundaries controlled by the person. Examples of internal barriers included a lack of confidence, poor attitudes towards technology, a lack of technical skills, negative perceptions of technology, resistance to technological change, and a lack of time needed to deliver courses (Alenezi, 2018; Allen & Seaman, as cited in Al Meajel & Sharadgah, 2018; Al Meajel & Sharadgah, 2018; Kim, as cited in Al-Shboul, 2013; Rogers, 2000).

External Barriers

External barriers were barriers outside of one's control (Rogers, 2000). Examples of the external obstacles included a lack of training and support, a lack of hardware and

software to support online learning, a lack of information, a lack of technologies such as computers (Amy & Sixl-Daniell, 2017; Bhati et al., 2010; Ohanu & Chukwuone, 2018), technological issues, inadequate funding, a lack of vision, a lack of institutional support, poor internet connection, limited infrastructure, and language issues since the learning management systems mainly used English (Alenezi, 2018; Al Meajel & Sharadgah, 2018; Rogers, 2000; Wilson, Sherry, Dobrovolny, Batty, & Ryder, 2000).

Institutional changes, such as transitioning from traditional to online courses, became barriers primarily for faculty who had never taught online. However, faculty needed to be comfortable with online course design as "teachers are a universal of the university paradigm and as universities change to adapt to the new episteme, so too must teachers" (Rajasingham, 2011, p. 7). With the future of higher education evolving around technology, teachers needed to adapt to technology changes to help the university stay mainstream and relevant. Gerlich (as cited in Keengwe & Kidd, 2010) and Allen and Seaman (2005) agreed faculty were aware online courses took longer to build in comparison to traditional courses. Faculty who were more comfortable teaching traditional courses hesitated to teach online. Lack of training and support for online course development created improper online course development, which raised concerns about the quality of courses (Keengwe & Kidd, 2010; Kim & Bonk, 2006; Zhang et al., 2004;).

Being learner-centered and self-paced was seen as an advantage of online learning, but at the same time could be perceived as detrimental. Learner-centered and self-paced learning required students to have the motivation to complete the course with little faculty supervision, creating an irregular experience for students, especially those

accustomed to traditional courses (Gargano & Throop, 2017; Garrison & Kanuka, 2004; Kim & Bonk, 2006; Zhang et al., 2004). The researcher believed in the importance of online course design to create engaging online courses through online learning systems. Poor online course designs created a barrier and affected the learning experience of students (Ally, 2004; Gargano & Throop, 2017; Garrison & Kanuka, 2004; Kim & Bonk, 2006; Zhang et al., 2004).

Technology continued to have significance in higher education; therefore, addressing barriers became important (EIU, as cited in Bhati et al., 2010). High-quality online support addressing internal and external barriers became critical to gain access to online teaching methods and to ensure the quality of learning experiences of students. Online teaching and learning could not survive without the proper technical support for faculty and students (Alenezi, 2018; Al Meajel & Sharadgah, 2018).

Instructional Designers and Instructional Technologists

The previous section highlighted potential barriers of faculty and students, which should be considered in online teaching and learning. To address internal and a few external barriers would require highly trained support staff such as instructional designers and instructional technologists. The following section highlighted the instructional designers' and instructional technologists' roles, purposes, and models for technology acceptance and online course design.

The Purpose of Instructional Designers and Instructional Technologists

Instructional designers at the time of the study were "responsible for facilitating the design process for effective, quality instruction, and providing pedagogical and curricular consultation for online course development" (Gragg, 2018, para 7).

Instructional technologists were different from instructional designers yet were equally important. Instructional technologists were responsible for training and integrating educational technologies (Moallem & Micallef, 1997; Reid, 2018). The purpose of instructional designers and instructional technologists was to provide faculty support for online course development when faculty used online platforms and teaching in online environments (Ritzhaupt & Kumar, 2015). Instructional designers and instructional technologists used the following models for technology acceptance and online course design.

A Brief History of Instructional Design

Instructional design began during World War II by many psychologists and educators constructing training materials. Within the mid 1950 to the mid 1960's the following instructional design models emerged: program instruction movement, the taxonomy of educational objectives, three domains of learning outcomes, five learning outcomes, and the nine events of instruction, also known as the conditions of learning ("Conditions of Learning (Robert Gagne)," 2018; "Domains of Learning," 2019; eLearning Infographics, 2015; Forehand, 2010; Gagne, 1984; "Instructional Design Timeline and History," 2020; 2020; Kruse, 2009; L.S.M.E., 2019; Reiser, 2007; Wilson, 2016). The instructional design models mentioned could use the following terminology: "Instructional design, systems development, systematic instruction, and instructional systems" (Reiser, 2007, p. 25).

B.F Skinner pioneered the instructional design model emerging in 1954 called the program instruction movement (eLearning Infographics, 2015; "Instructional Design Timeline and History," 2020; Reiser, 2007). The program instruction movement,

characterized as an education technique, ministered self-paced and self-administered instruction to learners (Pappas, 2014). The program instruction movement began at Harvard University alongside J.G Holland as an experiment. B.F. Skinner found learning was accomplished by dividing materials into "small incremental steps" (Pappas, 2014, para. 1), with feedback, reinforcement, and rewards for learners (Pappas, 2014). There were two models of programmed instruction, according to Pappas (2014): linear in which the "content is divided into a sequence of small and unchanged steps, where learners respond at their own pace and are immediately provided with the results" (Pappas, 2014, para. 2). The second model programmed instruction was Branching, in which Pappas (2014) stated the following:

> "problem-solving model, students have to address a situation or a problem through a set of alternative answers. If they answer correctly, they move on to the next set. If their answer is wrong, they are detoured to remedial study, depending on their mistake. This process is repeated for each step throughout the entire program." (para. 3)

B.F. Skinner's programmed instruction movement used the following principles: Learners should be active, on the spot feedback, gradual steps, self-pacing, and learner verification (Pappas, 2014)**.** The principle by which learners should be active confirmed comprehension of learning materials through questions and a profound understanding through answers. On the spot principle feedback suggested "immediate feedback" (Pappas, 2014, para. 4) from the instructor to the learner before the learner moves forward with learning. The gradual steps principle included learning chunks of information and learners making progression. The self-pacing principle stated learners

should be self-paced, and instructors should respect the pace of the student. Lastly, the learner verification principle advocated evaluating the program by the learners (Pappas, 2014).

In 1956, Bloomberg Benjamin pioneered the taxonomy of educational objectives (eLearning Infographics, 2015; Forehand, 2010; "Instructional Design Timeline and History," 2020; Reiser, 2007; Wilson, 2016). Bloomberg Benjamin's 1956 version of the taxonomy of educational objectives classified thinking through six levels of complexity: knowledge, comprehension, applying, analyzing, evaluating, and synthesis. However, in 2001, Anderson and Krathwohl revised Bloomberg's taxonomy of educational objectives through the new six levels of complexity: remember, understanding, applying, analyzing, evaluating, and creating. Researchers Forehand (2010) and Wilson (2016) explored Anderson and Krathwoh (2001)'s updated version of Bloomberg's taxonomy of educational objectives and the revised six levels of complexity. Forehand; 2010; Wilson, 2016 both stated remember allowed for recognizing, recalling, and recognizing knowledge from the long-term memory. Understanding implied the construction of meaning through written, oral, and graphical messaging or activities, which helped with explaining, comparing, classifying, and summarizing of materials learned (Forehand; 2010; Wilson, 2016). Applying stated materials learned were implemented or executed through assignments, presentations, interviews, or simulations (Forehand; 2010; Wilson, 2016). The analyzing level of complexity allowed for breaking down learning materials into concepts, relatable to the overall structure or purpose (Forehand; 2010; Wilson, 2016). Evaluating were judgments based on the criteria and standards through the use of checking and critiquing of learning materials (Forehand; 2010; Wilson, 2016). Lastly,

creating placed “elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing” (Wilson, 2016, p. 4). Both Forehand (2010) and Wilson (2016) stated the reason for revisions to Bloomberg’s taxonomy of educational objectives were because of the “relevance for 21st-century students and teachers” (Forehand, 2010, p. 2), and “to dissect and classify the varied domains of human learning” (Wilson, 2016, p.1) thought cognitive (knowing), affective (emotions) and psychomotor (kinesthetic) (Wilson, 2016).

In the 1960s, Robert F. Gagne was the pioneer of the following instructional design movements: the three domains of learning, the five learning outcomes, and the nine events of instruction, also known as the conditions of learning (“Conditions of Learning (Robert Gagne),” 2018; “Domains of Learning,” 2019; eLearning Infographics, 2015; Gagne, 1984; “Instructional Design Timeline and History,” 2020; Kruse, 2009; L.S.M.E., 2019; Reiser, 2007). The three domains of learning helped instructors develop and deliver lessons in which achieved thinking (cognitive), emotions (affective), and kinesthetic (psychomotor) among the learner (L.S.M.E., 2019). Cognitive (thinking) based on the six levels of complexity: remember, understanding, applying, analyzing, evaluating, and creating. Affective (emotions) were the attitudes that impacted responses to learning. Lastly, psychomotor (kinesthetic) were motor skills and physical activity and movements (Kruse, 2009; L.S.M.E., 2019).

In an article, Gagne (1984) expressed the five learning outcomes useful for human performance. The five learning outcomes included intellectual skills, verbal information, cognitive strategies, motor skills, and attitudes. Intellectual skills focused on “concepts, rules, and procedures” (Gagne, 1984, p. 379). Verbal information declared verbal

statements in terms of comprehension and recognizing the ideas of the learner. Cognitive strategies controlled the process through encoding, remembering, and thinking of the learner (Gagne, 1984). Also, motor skills were "repetition of the particular muscular movements involved" (Gagne, 1984, p. 382). Lastly, attitudes were the internal state that influenced the actions of the learner and the behavior (Gagne, 1984).

The article "Conditions of Learning (Robert Gagne)," 2018 and Kruse (2009) explored the nine events of instruction, also known as the conditions of learning. The nine events of instruction included the following: gaining attention, informing learners of the objective, stimulating recall of prior learning, presenting the stimulus, providing learning guidance, eliciting performance, providing feedback, assessing performance, and enhancing retention and transfer ("Conditions of Learning (Robert Gagne)," 2018; Kruse, 2009). Gaining attention was "capturing the attention of the student" (Kruse, 2009, p. 1). What learners should expect from the learning materials given was called informing learners of the objective. Stimulating recall of prior learning allowed for combining new learning material information with past knowledge, "creating easy encoding and storing of information for the long-term" (Kruse, 2009, p. 2). Presenting the stimulus presented new content in small organized chunks through explanation and demonstration. Providing learning guidance helped in storing new learning material into long-term knowledge. Eliciting performance allowed the learners to practice newly learned "skills or behaviors" (Kruse, 2009, p. 2) through course activities. Instructors provided feedback immediately to let the learner know if new materials learned were comprehended (Kruse, 2009). Assessing performance allowed the instructors to test learners of newly learned material through quizzes or other assessments (Kruse, 2009). Enhance retention and transfer

allowed the learner to take newly learned skills to the workforce. While in the workforce, the learner's skilled learned are enhanced in the workforce (Kruse, 2009).

The instructional design movements within the mid-1950 to the mid-1960s allowed instructional designers and instructional technologists to collaborate effectively with faculty to provide the best learning experience for students. Using instructional design models helped to support student learning achievement. The instructional design movements were why instructional designers and instructional technologists were essential staff in higher education, and the knowledge needed aiding faculty in online course design.

Systematic Instructional Design and Universal Design Learning

Instructional designers and instructional technologists used systematic design and universal design learning when assisting faculty with online courses. The systematic design considered faculty, students, course materials, and the learning environment for learning achievement. The instructional designer used systematic design to factor in the following: instructional goals and objectives, analysis of learning tasks, and use and evaluation of appropriate media to achieve learning task goals and objectives. Systematic design done with the course instructor during course building (Dick, Carey, & Carey, 1978; Kenny, Zhang, Schwier, & Campbell, 2005; Wong & Raulerson, 1974).

Instructional designers mainly focused on universal design when developing courses. Universal design focused on the learner's needs in a course (CAST, 2018). All materials and designs promoted engagement with, collaboration and communication in, and understanding of the course (CAST, 2018).

Instructional Designers and Tech Addressing Barriers through Blended Learning

As students became familiar with traditional learning and needed face-to-face experience with the instructor (Abdon et al., 2007), universities wanted to implement online learning throughout the institution through a blended learning approach. According to Qureshi, Ilyas, Yasmin, and Whitty (2012), blended learning was a mixture of traditional and online classrooms that helped students adapt to online learning. Flipped classrooms were an example of blended learning. Sandhu, Sankey, and Donald (2019) stated how positive students were towards the idea of flipped classrooms and suggested teachers use the model. Furthermore, Nat (2015) noted a "flipped classroom offers a student-centered approach with more engagement and interaction, as well as self-directed learning using the online materials" (p. 601). Like distance learning, blended learning used an LMS such as Canvas, Blackboard, and Moodle (Garrison & Kanuka, 2004; Hughes, 2007; Keengwe & Kidd, 2010; Rovai & Jordan, 2004; Zhang et al., 2004).

Instructional Designers and Techs Addressing Barriers through Flipped Classrooms

E-learning and flipped classroom methods were heavily used across universities as technology continued to advance and described as engaging. A flipped classroom, according to Herreid and Schiller (2013), was a new type of teaching methodology using internet resources that worked with any subject. Flipped classrooms were more for students from the electronic age. In flipped classrooms, the students watched lectures at home and completed scheduled activities in class based on the lecture watched. Activities included case studies, labs, games, simulations, and experiments. Homework was completed in class, and the advantage was students received immediate help from the instructor while the instructor gauged student learning (Herreid & Schiller, 2013).

Flipped classrooms promoted untraditional learning, using technology to customize the curriculum and flexibility. Flipped classrooms allowed students to think outside of the classroom while engaging with class activities at their own pace (Herreid & Schiller, 2013). According to researchers Herreid and Schiller (2013) and O'Flaherty and Phillips (2015), students tended to prefer flipped classrooms, evident in the student grades. However, flipped classrooms favored Generation Z students, who needed a series of activities to keep them actively engaged. The challenge, then, would be to ease students who were new to flipped classrooms into the alternative learning environment, so the students came to class prepared (Herreid & Schiller, 2013).

Internal Barriers Addressed Through Three Commonly Used Models

The ADDIE Model. The ADDIE model (Analyze, Design, Develop, Implementation, Evaluate) used as a systematic process for identifying the needs of the learner (Muruganantham, 2015; Reiser & Dempsey, 2012). The ADDIE model originated in 1975, further developed by Dick and Cary in 1978, and revised by Russell Watson in 1981. Experts considered ADDIE a critical asset to instructional development because the ADDIE model identified individual needs (Muruganantham, 2015). The ADDIE model, mainly used by instructional technologists, created high-quality training materials focused on the centered learner's needs (Muruganantham, 2015; Reiser & Dempsey, 2012). Through the ADDIE model, the instructional technologists achieved the goals and objectives of the learner (Reiser & Dempsey, 2012).

Each phase of the ADDIE model was vital in providing necessary helpful instructional materials to learners. The analysis phase of the ADDIE model "identifies a performance problem" (Reiser & Dempsey, 2012, p. 9). The design phase allowed the

instructional technologists to design learning materials based on the needs analysis. To properly implement the design phase, learning materials needed to provide clearly defined goals and the objectives relative to the needs analysis. Clearly defined goals and objectives provided the learners an understanding of what to expect during a facilitated training (Reiser & Dempsey, 2012). The development phase allowed the instructional technologist to determine if learning materials were ready for the learner (Peterson, 2003). Instructional technologists presented learning materials to other instructional technologists who critiqued learning materials before implementing the learning materials to the students. After the instructional technologist updated the learning materials based on feedback, the learning materials were presented to the learner by a facilitator during the implementation phase. As the analysis, design, development, and implementation phases were crucial, the final phase was most crucial; evaluation. The instructional technologist collected feedback from the learner and used the feedback to identify additional needs to improve learning materials (Peterson, 2003).

ARCS Model. Similar to the ADDIE model, the ARCS model (Attention, Relevance, Confidence, and Satisfaction) was a "systematic design process that can use with typical instructional design and development models" (Keller, 1987, p. 6). The ARCS model did not promote behavioral change but promoted motivational design (Keller, 1987; Pappas, 2015).

Attention is what Keller (1987) called "an element of learning" (p. 3). Keller (1987) also argued the attention of the learner was essential, yet "sustaining it" (p. 3) could be a challenge for instructors. Pappas (1987) mentioned five methods of sustaining the attention of the learners: active participation, use of humor, conflict, variety, and real-

world examples. Active participation was the learners actively engaging in an online course. The more learners actively engaged in online course activities, the "higher chances of completing the eLearning course" (para. 3). Pappas (2015) stated to use humor with caution. However, short stories with humor relative to the learning materials increased the sustainability of the learner's attention. Conflict, according to Pappas (2015), noted, "another technique to grab learner's attention is to present statements or facts that may be contrary to what the learner knows or believe to be true" (para. 3). Variety helped with the sustainability of the learner's attention by using alternating ways to present learning material. Lastly, real-world examples were another way to sustain the learner's attention by applying real-world experiences to new materials learned through course activities (Pappas, 2015).

According to Keller (1987), the relevance stage of the ARCS model focused on making learning materials relevant to the learner for the "present and future career opportunities" (p. 3). Group work projects where learners collaborated with peers demonstrated an example of relevance. Pappas (2015) also mentioned several "relevance strategies" (para. 8) to help maintain relevancy in learning: linking to previous experience, perceived present worth, perceived future usefulness, modeling, and choice. Linking to previous experience allowed the learner to connect previous content with new content. Perceived present worth was new knowledge or skill learned for real-life situations and problems (Pappas, 2015).

In comparison, perceived future usefulness included how skills were learned and used after completing the program, such as on the job experience (Pappas, 2015). Modeling involved skills and knowledge acquired through other people because

"knowing that other people have successfully applied the particular piece of knowledge or skill presented, motivates learners to perceive the eLearning course as useful and as the first step towards their personal success story" (Pappas, 2015, para. 12). Lastly, Pappas, 2015 communicated about choice as a strategy in implementing relevancy in learning. Choice allowed the learners to achieve learning by providing options according to what the learners "want to learn and how" (Pappas, 2015, para. 13).

Keller (1987) identified confidence to help with "persistence and accomplishment" (p. 5) of the learner. Keller (1987) also stated effort from the learner resulted in possible success in the course. Pappas (2015) suggested the following aided in raising student confidence: facilitate self-growth, communicate objectives and prerequisites, provide feedback, give learners control. Facilitate self-growth would "encourage learners to take small steps and immediately show them their progress in the eLearning course" (Pappas, 2015, para. 15). Communicated objectives and prerequisites provided the learner with advance notice of what to expect and needed to achieve in a course. Providing feedback was vital to learners so learners "know where they stand" (Pappas, 2015, para. 17) in a course. Lastly, Pappas (2015) believed learners needed little control over the learning experience to provide students a sense of independence and responsibility for success.

Lastly, Keller (1987) identified satisfaction as a learner's feeling of accomplishment. However, Keller (1987) warned instructors to have less control over how tasks and rewards were defined to avoid resentment from the learner. Instead, Pappas (2015) suggested instructors use the following to apply satisfaction components while lowering the chance of resentment: praise or rewards and immediate application.

Issued to the learner by the instructor were praises or rewards, given learners a sense of accomplishment. The immediate application was applying newly learned materials to real-world situations or course activities (Pappas, 2015).

Overall, the ARCS model components were similar to the components of the ADDIE model and were characteristics of each phase in the ADDIE model. The ARCS model was not a clearly defined model or systematic to improve the overall quality of training materials. The ARCS model focused on motivation, yet motivation was less useful for solving issues in the classroom.

Technology Acceptance Model (TAM). While the ARCS model focused on motivational design, instructional designers and instructional technologists also used the Technology Acceptance Model (TAM). The Technology Acceptance Model allowed instructional designers and instructional technologists to address behaviors and challenges regarding technology (Fathema, Shannon, & Ross, 2015). The Technology Acceptance Model was essential to address technical uncertainties because instructional designers and instructional technologists understood online course design required faculty to use instructional technologies such as Canvas and Blackboard. Lai and Hong (2015), Laurillard (2007), and Sutton and DeSantis (2017) agreed instructional technologies provided individual learning, quality learning, and practical learning. Also, Generation Z and students alike were equipped with technical skills, while faculty may have had minimal technical skills and background (Chun et al., 2015).

Transitioning courses from traditional to online may have attributed to negative perceptions and attitudes toward using technologies. Perceptions, and attitudes categorized under internal barriers. Faculty would not use technology unless technical

uncertainties causing the negative perceptions addressed (Collins & Tilson, 2001; Fathema et al.,2015; Sutton and DeSantis, 2017). Instructional designers and instructional technologists solved internal barriers using the "theory of technology acceptance model" (Al-Rahmi, Alias, Othman, Alzahrani, Alfarraj, Saged, & Rahman, 2018, p. 14268). Instructional designers and instructional technologists used the Technology Acceptance Model to help faculty understand and feel comfortable using technology. Instructional designers eased uncertainty with technology by applying the Technology Acceptance Model.

The shifting of courses required support and training for new or experienced full-time and adjunct faculty during online course development. Since learning new technology was cumbersome for faculty, Chun et al. (2015) suggested providing technology workshops or one-on-one training with faculty who were new to online learning and online learning platforms. The instructional designer applied the ADDIE model plus the Technology Acceptance Model. As technology advanced and influence higher education, institutions addressed barriers (EIU, as cited in Bhati et al., 2010). Therefore, universities needed to be on board with investing in high-quality online support that addressed internal and external barriers. Online teaching and learning did not survive without the proper technical support for instructors and students (Alenezi, 2018; Al Meajel, & Sharadgah, 2018).

Financial Considerations in Higher Education

The previous section highlighted the importance of instructional designers in higher education. As new technology continued to develop an online education became a part of "higher education's heritage" (Thelin, 2017, p. 53), universities needed to

consider the cost. Provided technical support for online learning and development is crucial to provide full-time and adjunct faculty. However, the university needed to consider the cost associated with online development and technical support.

Hiring Proper Staff Support and Faculty Skillful in Technology

To have quality online courses, the university needed to consider hiring good staff and faculty, instructional designers, and instructional technologists who provided faculty support for online course development (Ritzhaupt & Kumar, 2015). The university also needed to consider hiring more faculty with technology skills (Buzzetto-Hollywood, 2018). Hiring faculty with technology skills benefitted generational students when adopting technology into the curriculum. Additionally, universities needed to consider the cost of technology equipment and infrastructure updates and the proper hiring of information technology staff to support them (Alenezi, 2018). Universities supporting online learning incurred costly expenses. However, the support and technology needed for online learning were critical to both online teaching and the students' learning experience (Kim & Bonk, 2006; Laurillard, 2007).

Investing in the Right Technology

Technological developments allowed for flexible learning and providing the learning needs of each generation. According to Laurillard (2007), "technology-enhanced learning is expected to make a radical difference to education, specifically, the quality and effectiveness of the learning experience" (p. 22). However, technology-enhanced learning comes with a high cost affecting universities and colleges. Laurillard (2007) stated acquiring new digital technology in universities costs more than traditional materials. When managing the cost of technology, universities must consider examining

previous approaches and measuring the benefits (Buzzetto-Hollywood, 2018; Laurillard, 2007). The purchase of technology based on what helped the students' learning experience while keeping the cost low.

If technical support staff and cost not considered, could decrease student retention. Hughes (2007) stated instructor support was the key to retention. If faculty not supported with the right training or assistance with technical issues, the students' learning experience suffered. Furthermore, cost considerations, such as hiring online developers and technical staff to support online learning, were directly related to the students' learning experience (Hughes, 2007).

The Importance of Investing in Support

The previous section highlighted the importance of cost consideration when incorporating new technology in higher education institutions. The current literature demonstrated the importance of online learning, staffing support, and cost through three countries—Nigeria, Pakistan, and Saudi Arabia—and the barriers each country had to online teaching methods.

Limited Access to Online Teaching Methods in Nigeria

People in Nigeria understood teaching with online platforms was of global interest. However, institutional, faculty, and student barriers hindered Nigeria from creating online courses for graduate and undergraduate students. The main obstacles for accessing online education in Nigeria included the digital divide, government policies, language proficiency, limited access to information and communication technologies (ICT), limited funding, a lack of internet access, low-quality support services, and poverty.

A Fallen Economy's Impact on Online Education. Nigeria's economy contributed to institutional obstacles. Nigeria was an agrarian economy when the nation gained independence in 1960. Although Nigeria was a primary contributor to the agricultural market in the 1970s, the country switched to oil and became a mono-product economy. Unfortunately, the oil demand later decreased, sending the Nigerian economy into a significant crisis in 1980, altering government funds, revenue, and Nigerians (Adeyemi & Abiodun, 2014; Lipset & Lenz, as cited in Obamuyi & Fapetu, 2016; Obamuyi & Fapetu, 2016).

Moreover, the fall of the economy resulted in illicit activities such as smuggling and vandalism of government property. Nigeria was under the Structure Adjust Program, assisting struggling countries, yet the program failed to achieve financial results. The crisis became worse, causing critical areas of Nigeria society to fail as life expectancy fell. Poverty also became a significant issue for "70%" (Obamuyi & Fapetu, 2016, p. 34) of the population—"social and political factors" (Obamuyi & Fapetu, 2016, p. 35) of Nigeria crippled investments and the growth of the nation's economy (Obamuyi & Fapetu, 2016). Besides, social problems caused Nigerians to not interact with one other, and political issues included government changes and politics relative to social parties that impacted the social environment (Adeyemi & Abiodun, 2014; Lipset & Lenz, as cited in Obamuyi & Fapetu, 2016; Obamuyi & Fapetu, 2016).

The economic crisis involved some Nigerians securing and misusing wealth and power, which brought about more financial instability. Financial instability impacted unemployment because the government mismanaged resources, was corrupt and had political impunity (Adeyemi & Abiodun, 2014; Lipset & Lenz, as cited in Obamuyi &

Fapetu, 2016; Obamuyi & Fapetu, 2016). In the end, Nigeria's failing economy impacted higher education's access to online learning support (Ohanu & Chukwuone, 2018).

Institutional barriers were also related to Nigerian faculty members. Faculty barriers adapted to new technologies and encountered technology anxiety and poor attitudes towards technology. Due to the faculty obstacles mentioned, results showed an unwillingness to teach online and a resistance to adopt new technologies. Furthermore, faculty barriers resulted in student barriers, causing Nigerian students to lack the interest, engagement, and motivation to participate in online courses (Chen & Tseng, as cited in Ohanu & Chukwuone, 2018; Gulati, 2008; Konayuma, 2015; Ohanu & Chukwuone, 2018; Olugbeko, as cited in Ohanu & Chukwuone, 2018; Tella, Orim, Ibrahim, & Memudu, 2018).

Limited Access to Online Teaching Methods in Pakistan

Unlike Nigeria's distressed economy, Pakistan's economy grew, allowing for increased access to information and communication technologies (ICT). Furthermore, Pakistan would like to integrate information and communication technologies into the students' learning experience because of the changing demographics of students, globally delivered education, and innovations in technology (Concannon, Flynn, & Campbell 2005; Qureshi, Ilyas, Yasmin, & Whitty, 2012).

Lack of Government Funds for Pakistan Higher Education. Similar to Nigeria, some barriers hindered institutions in Pakistan from achieving the goal of integrating information and communication technologies into an online curriculum. The institutional barriers included infrastructure, internet connection, language, and lack of

training and support. The lack of government spending significantly created additional obstacles (Al Meajel & Sharadgah, 2018; Qureshi, Ilyas, Yasmin, & Whitty, 2012;).

According to Khan and Bhatti (2016), the Higher Education Commission (HEC) provided funds for Pakistani universities since 2003 to support teaching and learning and to improve the quality of higher education and research. The HEC received grants from the federal government for public higher education institutions. However, "financial constraints combined with ever-rising inflation and recession in the economy would have affected the quality of services and resources" (Khan & Bhatti, 2016, para 10). The lack of financial support from the government meant the inability of institutions in Pakistan to access online teaching methods by integrating information and communication technologies.

Furthermore, faculty barriers in Pakistani institutions included resistance to change, negative perceptions of technology due to a lack of computer skills, which resulted in the poor delivery of courses. Student barriers increased by faculty barriers and included the need for face-to-face interaction since online learning was mostly self-paced. Poor Pakistani students had no access to ICT and were not willing to accept the usage of new technology and perceptions of technology (Al-Mahmood & McLoughlin, 2004; Andersson & Grönlund, 2009; Qureshi, Ilyas, Yasmin, & Whitty, 2012; Surry, Ensminger, & Jones, 2002).

Limited Access to Online Teaching Methods in Saudi Arabia

Like Pakistan but in contrast to Nigeria, Saudi Arabia had a growing economy due to "the need to provide a skilled, educated workforce, the growth of the private sector, and the diversification of the economy are major contributions to the rising

economic and social growth" (Issa, Isaia, & Kommers, as cited in Alenezi, 2018, p. 3). Because of Saudi Arabia's growing economy, the country wanted to invest in online higher education through the support of the Ministry of Education. Internet access allowed online courses to evolve, which helped with the overcrowding of universities in Saudi Arabia (Alenezi, 2018).

Similar to Nigeria and Pakistan, Saudi Arabia had institutional barriers that prevent the country from achieving specific goals to provide access to online education. Institutional barriers included poor internet connections, limited infrastructure, language, funding, lack of hardware and software, and technical support. The cultural norms of Saudi Arabia were also related to institutional barriers (Alenezi, 2018; Alshahrani & Ally, as cited in Alenezi, 2018).

Saudi Arabian Culture and Education. Baki (2004) and Onsman (2011) explained how Saudi Arabian culture created barriers to online education. The goal for higher education in Saudi Arabia was to help enhance the economy while maintaining culture and tradition. Roots of the religious and tribal culture began in the eighteenth century when Saudi Arabia was not a strong economy (Baki, 2004). The strong economy was due to the discovery of oil "in 1970" (Baki, 2004, p. 2). Labor needs of oil allowed Saudi Arabia to build homes, schools, and universities, yet it weakened tribal roots (Baki, 2004). However, Saudi Arabian culture stays faithful to the Qur'an and Shari'a law. Shari'a law allows for the protection of human rights, while the Qur'an allows for equal rights for the men and women of Saudi Arabia (Baki, 2004). The Qur'an also required men and women to receive an education. However, the Qur'an did not allow women and men to mix for fear of seduction, causing gender segregation (Almunajjed, 1997; Baki,

2004). As a result, a few universities built for women, and one mixed-gender university called KAUST built, where culture and religion did not hinder education (Onsman, 2011). Onsman (2011) also stated structuring faculty and staff in universities could be difficult due to gender segregation.

Institutional barriers led to faculty barriers in the following areas: traditional preferred over online teaching and the lack of technology skills. Faculty barriers created students' obstacles in the following ways: lack of technology skills, belief in a face-to-face classroom, misconceptions of online learning, and learning management systems interface (Alenezi, 2018; Alshahrani & Ally, as cited in Alenezi, 2018).

The Future of Technology and Higher Education

Technology continued to advance, and universities needed to implement specific advancements to stay mainstream and relevant to other universities and online learning. Moreover, with continued rapid technology advancements, "online education is becoming an important long-term strategy for many postsecondary institutions" (Kim & Bonk, 2006, p. 23). Future implications for the instructors needed to focus on continued growth and development of technology skills, online learning, and courses; the skills were imperative for the online learning environment. Additionally, the faculty needed to continue researching ways to keep students collaborating and engaged in online courses (Kim & Bonk, 2006).

Furthermore, as online education continued to grow, universities needed to think about supporting online faculty. Keengwe and Kidd (2010) explained, "to help faculty develop and teach online courses requires that instructional guides, professional development opportunities, and instructional materials carefully designed to address all

components of the learning and teaching process" (p. 537). Also, universities needed to consider what types of new technology and learning platforms best suited the student learning experience. Universities needed to consider hiring highly skilled technology faculty, instructional designers, and technical support, all of which came at a cost. In contrast to what Knoedler (2015) stated, and which Laurillard (2007) would disagree with, digital technology costs more than traditional classrooms. Lastly, when managing the cost of technology, universities needed to consider examining previous approaches and measure the benefits through ongoing investigations (Buzzetto-Hollywood, 2018; Laurillard, 2007). Overall, the future implications universities needed to consider were ultimately related to student retention (Keengwe & Kidd, 2010; Zhang et al., 2004).

Summary

Using current literature, the researcher explored the importance of online learning and the relationship to higher education. Chapter Two included the historical background of traditional and online learning, online learning platforms, and the history of each generation. Internal and external barriers were explored and investing in the right staff, such as instructional designers and instructional technologists, who could address internal and a few external barriers. The researcher demonstrated the importance of hiring the proper support staff for online learning through three countries, Nigeria, Pakistan, and Saudi Arabia. The purpose of Chapter Two was to support the researcher's study and support Thelin's (2017) statement describing online learning as a part of "higher education's heritage" (p. 53). In Chapter Three, the researcher discussed the research design and methodology for the mixed-method examination of generational faculty perceptions during online course design.

Chapter Three: Methodology

Restated Purpose and Context of this Study

The purpose of the study was to conduct a mixed-methods examination of the perceptions of full-time and adjunct faculty who developed online courses, organized by generation. The researcher focused on the following perceptions: technology, ease of use of technology, training and support, and the time needed to learn and develop online courses. Perceptions from each generation depended on years of online course development and the frequency of using an instructional designer. Therefore, the researcher also examined the frequency of training and support received from an instructional designer. The researcher examined administrative, full-time, and adjunct faculty from four schools: The School of Professional Studies (SPS), the School of Education (SOE), the School of Arts (SOA), and the School of Business (SOB).

Rapid changes in technology caused colleges to create more online degree programs, and full-time and adjunct faculty were at the frontline on creating online courses. In the researcher's experience, as an instructional designer, transitioning courses to the online environment could potentially cause internal barriers, primarily for full-time and adjunct faculty who never taught online. However, instructional designers and instructional technologists helped address faculty internal barriers. Therefore, the researcher studied full-time and adjunct faculty who transitioned from on-ground courses to online courses to understand faculty perceptions and possibly reduce resistance during online course development. Lastly, the researcher wanted to understand the training and support available to different generations to individualize faculty training, according to generational learning styles and characteristics. The researcher found Traditional, Baby

Boomer, Generation X, and Generation Y full-time and adjunct faculty at the Midwestern University predominately taught Generation Z students.

Hypotheses

The researcher developed the following six hypotheses:

Null Hypothesis 1: There is no difference between faculty perceptions of technology by generation when developing online courses.

Null Hypothesis 2: There is no difference between faculty perceptions by generation in the ease of use of technology when developing online courses.

Null Hypothesis 3: There is no difference between faculty perceptions by generation in the training and support needed to develop online courses.

Null Hypothesis 4: There is no difference between faculty perceptions by generation in the time needed to learn how to develop online courses.

Null Hypothesis 5: There is no difference between faculty perceptions by generation in the time needed to complete the development of online courses.

Null Hypothesis 6: There is no difference in the faculty years of experience, and the frequency of training and support received from an instructional designer.

Research Questions

The researcher developed the following five research questions:

Research Question 1: How does each generation perceive technology when developing online courses?

Research Question 2: How does each generation perceive the ease of use of technology when developing online courses?

Research Question 3: How does each generation perceive the training and support needed to develop online courses?

Research Question 4: How does each generation perceive the time needed to learn how to develop online courses?

Research Question 5: How does each generation perceive the time needed to complete the development of online courses?

Learning and Development of Online Course Survey

The researcher focused on the following generational faculty perceptions: technology, ease of use of technology, training and support, and the time needed to learn and develop online courses. The researcher also examined the frequency of training and support full-time and adjunct faculty received from an instructional designer. To examine generational faculty perceptions and the frequency of training and support received from an instructional designer, the researcher built a survey in Qualtrics using the following five open-access questionnaires: Technology Integration Survey (Kopcha, 2012), Technology Perceptions Scale (Karaca et al., 2013), Teachers' Intention to Use Technology Survey (Teo, 2011), Technology Acceptance Questionnaire (Hwang et al., 2013), and Technology Attitudes, Perceptions, and Support Scale (Peffer et al., 2013). The researcher downloaded each survey from the PsycTEST database provided through Midwestern University.

The technology integration survey (Kopcha, 2012) focused on vision, access, beliefs, professional development, and time in conjunction with technology integration. Vision focused on technology supporting "content objectives" (Kopcha, 2012, p. 2), administrative support using technology, and reasonable goals or demands when using

technology. Access focused on the accessibility of technology regarding access to technical support. The beliefs portion of the survey focused on technology supporting student learning, designing course activities, and supporting the jobs of teachers. The professional development portion of the survey focused on adequate training and support on the use of technology for the classroom. Lastly, the time portion of the survey focused on adequate time needed to learn and integrate technology into the faculty's courses (Kopcha, 2012). The researcher used one professional development question from Kopcha's (2012) survey to answer questions about the generational faculty perceptions of training and support received from an instructional designer during online course development. The researcher also used one question from the time section to measure the perceptions of time needed to learn and develop online courses. The researcher obtained permission to use the survey from the PsycTEST database.

The technology perceptions scale (Karaca et al., 2013) focused on principal support, colleague support, attitudes and beliefs, and lack of time in conjunction with perceptions of technology. Principal support focused on administrative training and support when integrating technology into teaching. Colleague support focused on teachers supporting teachers when using technology in teaching and learning. Attitudes and beliefs focused on the attitudes and beliefs of how teachers justified technology to help support learning and courses. Lack of time focused on the amount of time needed to learn or build a course using technology (Karaca et al., 2013). The researcher used two questions from the item of principles support to measure training and support perceptions during online course development. The researcher also used one question from the lack-of-time section to measure the perception of time given to learn and develop online

courses. The researcher obtained permission to use the survey from the PsycTEST database.

The Teachers Intention to Use Technology Survey (Teo, 2011) focused on perceived usefulness, perceived ease of use, subjective norm, facilitating conditions, attitudes towards use, and behavioral intention to use, regarding the participant's intention to use technology in learning. Perceived usefulness focused on the teacher's use of technology to enhance the teacher's overall performance on the job. Perceived ease of use focused on the participant's ease of learning to use technology, allowing technology to do a required task, ease of use, and mastery of technical skills. Subjective norms focused on the influence of others to use technology in everyday work. Facilitating conditions focused on support and assistance when encountering technological issues. Attitudes towards use focused on attitudes toward technology in everyday work tasks while the behavioral intention to use focused on the expectancy of technology use in the future (Teo, 2011). The researcher used one perceived ease-of-usefulness question to measure faculty perceptions. The researcher also used two facilitating condition questions to measure faculty perceptions of training and support during online course design. The researcher obtained permission to use the survey from the PsycTEST database.

The Technology Acceptance Questionnaire (Hwang et al., 2013) focused on usefulness and ease of use when integrating technology into education. Usefulness focused on the learning system to provide activities, new knowledge, smoother learning processes, obtaining useful information, and better learning approaches. Ease of use focused on how simple a learning system was during teaching and learning (Hwang et al.,

2013). The researcher used one ease-of-use question when measuring the faculty perceptions of the ease of use of technology and obtained permission to use the survey from the PsycTEST database documented.

The Technology Attitudes, Perceptions, and Support Scale (Peffer et al., 2013) focused on the attitudes and perceptions of technology usage and support. The researcher used three questions: one measured faculty perceptions of ease of use of technology, one measured faculty perceptions of technology, and one measured training and support. The researcher contacted Taylor and Francis publishing company by email, seeking permission to use and modify the Technology Attitudes, Perceptions, and Support Scale (Peffer et al., 2013). The researcher obtained permission to use the survey from the PsycTEST database.

The researcher extracted and modified forced-choice questions from the five open-access surveys to fit the needs of the researcher and test each hypothesis. Table 1 includes the original survey questions and how the researcher modified each question.

Table 1

Question #	Original Question	Survey	Question #	Question in Survey
N/A	Use of technology requires more planning than traditional instructional methods.	Technology Attitudes, Perception, and Support Scale TAPS	Q12:	The use of instructional technology requires more planning than on-ground (traditional) instructional methods.
Q5:	It was not difficult for me to use the learning system during the learning activity.	Technology Acceptance Questionnaire: Ease of Use	Q13:	It is easy for me to use Canvas for online course development.

Table 1 continued

N/A	I am comfortable using technology as a teaching tool.	Technology Attitudes, Perception, and Support Scale TAPS	Q16:	It is easy for me to use Canvas for online course development.
PU1:	Using technology enables me to accomplish tasks more quickly.	Teachers' Intention to Use Technology Survey: Perceived Usefulness	Q17:	I am able to use instructional technology with little difficulty when I want to complete a task.
Q1:	I want to have more information about technology use in lessons.	Technology Perception Scale: Attitude and Belief Scale	Q21:	I would like more information about instructional technology use for online course development.
N/A	I felt adequately trained on the skills needed to use technology.	Technology Integration Survey: Professional development section	Q22:	I felt adequately trained on the skills needed to use instructional technology.
N/A	If additional professional development or training would become available on the integration of technology and EE, I would participate.	Technology Attitudes, Perception, and Support Scale TAPS	Q23:	I would participate in additional professional development on instructional technology.
Q3:	When I come across a technology-related problem at school, I can easily obtain technical assistance.	Technology Perception Scale: Items of “Principle Support” scale	Q24:	I can easily obtain technical assistance when I come across an instructional technology-related issue.
Q9:	Adequate in-service training opportunities are	Technology Perception Scale: Items of “Principle	Q25:	Adequate in-service training opportunities are provided by the University.

provided in our school.	Support" scale

After the researcher used five open-access questionnaires from the university's PsycTEST database, the researcher included six open-ended questions assessing the following: perceptions of technology; ease of technology use; the time needed to learn, and complete online course development; and training and support. After building the Qualtrics survey, the researcher asked the university's psychology department, the writing center, and the Student Support Services department to participate in a pilot testing of the survey. The psychology department specialized in survey building and was utilized to critique the overall survey for understanding and flow. The writing center checked for grammar, flow, and understanding of the survey. Student Support Services specialized in working with students and provided different insight from the psychology department and writing center. After piloting the survey, the researcher updated the survey according to the pilot testers' edits.

The researcher also developed interview questions for participants wanting to further elaborate on the survey. The original interview questions focused on resistance until the study was changed to focus on generational faculty experiences during online course design**.** To participate in the optional interview, the researcher embedded a link within the Learning and Development of Online Course survey to a separate Qualtrics survey titled, Emails for Interview. The Emails for Interview survey collected emails and preferred methods of interviewing: Zoom web conferencing, face-to-face, and phone. The researcher used email to confirm the interview date and time, the interview method, and what to expect during the interview. Overall, the researcher used six open-ended questions within the Qualtrics survey and the follow-up interview questions to answer the

five research questions to understanding generational faculty perceptions during online course development. Appendix A documented the original and updated follow-up interview questions.

Seeking Approval

After developing, testing, and editing the survey and interview questions, the researcher sought permission from the deans to study full-time and adjunct faculty at the School of Business (SOB), the School of Education (SOE), the School of Arts (SOA), and the School of Professional Studies (SPS). To study the School of Professional Studies, the researcher agreed with the dean and the interim dean to begin data collection in mid-March and early April 2020. The administrative assistants, program directors, and assistant deans created a Microsoft Outlook email distribution list for participants who met the criteria to participate in the study. The researcher used the distribution list to send the study-participation consent form and the Learning and Development of Online Course survey link. After dean approvals within each school, the researcher's doctoral committee granted prospectus approval and the Institutional Review Board (IRB) granted approval to proceed with the study to the researcher in December 2019.

The Research Site and Participants

A Midwestern four-year private institution participated in a study focused on full-time and adjunct faculty from the following schools: The School of Business (SOB), the School of Education (SOE), the School of Arts (SOA), and the School of Professional Studies (SPS)**.** Data collection began on December 17, 2019, and ended on March 20, 2020. Due to high interest, the School of Professional Studies full-time and adjunct faculty participated earlier than scheduled, beginning on March 1, with permission from

the interim dean. From all schools combined, a total of 137 participants examined who developed online courses within the past two years.

Data Collection and Analysis Procedures

The researcher distributed the survey using Outlook email under the close supervision of the deans, assistant deans, program directors, and administrative assistants. The email included the study-participation consent form and the "Learning and Development of Online Course" survey link. The participants confirmed participation in the study by clicking on the link. The survey was open for six weeks, except for the School of Professional Studies. The interim dean from the School of Professional Studies requested the survey remain open for three weeks. In the third week, the participants received a reminder email, informing all of the additional weeks to complete the study. At the end of the six weeks, the participants received an email, informing participants the survey was closed. The researcher removed the distribution list from the researcher's work computer upon the conclusion of the data collection. Due to the use of Qualtrics, all surveys remained anonymous.

Participant Interviews

Following the completion of surveys from each school, the researcher conducted follow-up interviews with any participant wanting to participate in a follow-up interview, according to the "Emails for Interview" survey. The researcher emailed participants to schedule each interview, according to the participants' dates, times, and preferred methods of interviewing (Zoom, phone, or face-to-face). Interviews completed over the phone used Rev Call Recorder, a smartphone application used to record and transcribe telephone calls upon the conclusion of the call. Rev Recorder was another smartphone

application used to record the face-to-face interviews, with the option to transcribe upon the discussion's conclusion. The researched Midwestern private university offered Zoom as a web conferencing tool to conduct interviews for uncomfortable participants speaking over the web. The recorded Zoom interviews were audio-only.

Quantitative and Qualitative Analysis tools

To help with the quantitative analysis, the researcher created 30 forced-choice questions within the survey, aligned with each hypothesis. The researcher removed open responses in the survey from the raw data to focus on the analysis of the quantitative responses. The researcher downloaded the raw data from Qualtrics to analyze the data and divided the survey responses by generation (Silent Generation, Baby Boomers, Generation X, and Generation Y) in conjunction with the perceptions of technology, the usability of technology, professional development and support, time to learn and prepare for online development, and online development experience. The researcher used the following statistical analysis on the forced-choice responses from the survey: descriptive statistics, cross-tabulations, Chi-Square test of independence, and Kruskal-Wallis H test. The researcher used descriptive statistics to summarize the sample and measures of the demographic and independent variables. The researcher employed cross-tabulations (contingency tables) to analyze the correlations or relationships between independent and dependent variables and conducted Chi-Square tests of independence to measure the relationship between the independent variable generations and five dependent variables (LMSType, TeachingType, DifLevelGrp, CanvasFunc, and NotESupport). The Kruskal-Wallis H test, a non-parametric test and an alternative to the one-way ANOVA, was used

to determine if there were statistically significant differences between two or more groups of an independent variable on a continuous or ordinal variable.

The researcher analyzed the open-ended responses from the survey separately from the interview responses and categorized the responses by each generation (Silent Generation, Baby Boomers, Generation X, and Generation Y) in conjunction with the perceptions of technology, the usability of technology, professional development and support, time to learn and prepare for online development, and online development experience. A tool called NVivo12 helped code and seek emergent patterns from the qualitative data aligned with each research question, according to participant responses from the open-ended questions in the survey.

The researcher conducted three interviews over the phone and one face-to-face interview and transcribed them using the Rev Call Recorder application. The researcher pushed all transcriptions through NVivo12, which helped the researcher code and seek emergent patterns from the qualitative research aligned with each question, according to the results of the phone and face-to-face interviews. The researcher shared the results with the deans and participants who asked for the results of each school by utilizing researcher-developed codes to maintain participant anonymity.

Summary of Chapter Three

Faculty barriers were a concern of the researcher when moving courses to the online environment. As a result, the researcher examined the following generational faculty perceptions during online course design: ease of use, training and support, and time needed to learn and develop online courses. The researcher also examined the frequency of training and support received from an instructional designer seeking to

understand the above perceptions to find faculty barriers during online course design and individualize faculty training, according to generational learning styles and characteristics. The researcher assessed multiple generations regarding perceptions of technology, ease of use, time, training and support, and experience in online course development to help fill the gap in the literature related to organizational changes involving technology. The researcher deemed the study essential to gather generational faculty perceptions when transitioning from on-ground to online courses. Chapter Four includes the study results of the generational faculty experience and perceptions.

Chapter Four: Results

Restated Purpose and Context of this Study

Chapter Four details the researcher's quantitative analysis through a Chi-Square test of independence and the Kruskal-Wallis H test. Chapter Four also includes the researcher's qualitative analysis through interviews and open-ended survey responses. The purpose of the study was to conduct a mixed-methods examination of perceptions of full-time and adjunct faculty who developed online courses, organized by generation. The researcher focused on the following perceptions: technology, ease of use of technology, training and support, and the time needed to learn and develop online courses. Perceptions from each generation could depend on years of online course development and the frequency of using an instructional designer, which the researcher also examined. The researcher examined full-time and adjunct faculty from four schools: The School of Professional Studies (SPS), the School of Education (SOE), the School of Arts (SOA), and the School of Business (SOB).

Quantitative Analysis

A small sample size impacted statistical data analysis. The researcher employed data gathered from 48 participants in the analyses, including frequencies, cross-tabulations, a Chi-Square test of independence, and the Kruskal-Wallis H test. The 48 participants included five Silent Generation (Traditional), 21 Baby Boomers, 17 Generation X, and five Generation Y (Millennials). Due to the small sample size, a violation of assumptions occurred when running the Chi-Square test of independence, resulting in a high number of test statistics results found non-significant for the variables supporting Hypotheses 1-5. The statistical tests were affected by the small sample size; a

larger sample of Silent Generation (Traditional) and Generation Y (Millennials) may have yielded different results. However, the researcher found only a few components of Hypothesis 6 rejected the null hypothesis.

Data cleaning. Data cleaning was the process of ensuring the data were accurate, consistent, usable, and free of errors and inconsistencies. The researcher cleaned the raw data from the survey's Excel spreadsheet to produce quality data for the analysis, by removing data that distorted the analysis and were standardized in a single format. Once cleaned, the researcher imported the Excel spreadsheet with the transformed variables into the Statistical Package for Social Sciences (SPSS) software for analysis. SPSS is an IBM-owned statistical software platform that organizes and extracts "actionable insights from its data" (IBM, 2020). SPSS was the appropriate analysis tool, based on the researcher's questions and the type of data collected.

Statistical Data Analysis Procedure

The researcher ran descriptive statistics on the demographic and independent variables to produce a summary of the sample and measures; see Table 2. The researcher ran the frequencies for the variables in SPSS; see Table 2 for the statistics for each sample. Baby Boomers were the largest generation to respond to the researcher's survey, with 43.8% participation. Generation X was the second largest group, with 35.4%. The Silent Generation and Generation Y were the smallest groups to participate in the researcher's study, both at 10.5%. Most participants were full-time faculty members (50%), while a few were administrators (12.5%). The School of Business (SOB) had the most participants in the researcher's study, at 47.7%, and the School of Education had the lowest number of participants, at 6.3%. All participants had course development

experience within the last two years, or participants would not qualify. Of the participants, 77.1% had zero to three years of experience with online course design before developing online courses at the researched university.

Table 2

Descriptive Statistics for the Sample

Predictor	N	(%)
Generation		
Silent Generation	5	10.4%
Baby Boomers	21	43.8%
Generation X	17	35.4%
Generation Y	5	10.4%
Position		
Administrator	6	12.5%
Full-time Faculty	24	50.0%
Part-time Faculty	18	37.5%
School		
School of Professional Studies	18	37.5%
School of Arts	5	10.4%
School of Business	20	41.7%
School of Education	3	6.3%
Developed Courses Within the Last Two Years		
Yes	48	100.0%
No	0	0.0%
Years of Experience		
0–3 Years	37	77.1%
4–6 Years	6	12.5%
7–9 Years	1	2.1%
10+ Years	2	4.2%

The researcher ran cross-tabulations (contingency tables) to analyze the correlations or relationships between the independent and dependent variables. The cross-tabulations showed the number or frequency of respondents described in the table. The researcher used the Chi-Square test of independence to measure the relationship between the Generations independent variable and five dependent variables. The Chi-Square test of independence tested whether a statistically significant relationship existed between the independent and dependent variables. Out of the five dependent variables, TeachingType was significant, because the TeachingType variable showed a relationship between the four generation types. Each generational member of faculty used an online, hybrid, or on-ground modality, or a combination of modalities when developing an online course.

Initially, the researcher ran a one-way ANOVA on the data and used the results to compare the means of two or more independent groups. The researcher treated the dependent variables, which were ordinal, as interval variables, making it acceptable to use the test. However, the test results showed the variances were not equal, which violated the assumption of the homogeneity of variances. Since the assumption of the one-way ANOVA failed, the researcher used the Kruskal-Wallis H test.

The researcher used the test, which was non-parametric, to determine if there were statistically significant differences between two or more groups of independent variables on a continuous or ordinal variable. As such, the researcher ran the test to determine if there were statistically significant differences between the four generation groups, the independent variable, and the 12 dependent variables, measured on a seven-point Likert scale. The researcher ran the test to determine whether there were

differences in the distribution of the groups (rather than differences in the mean because the results from the ANOVA showed that the variances were not equal). The Kruskal-Wallis H test was the alternative to the one-way ANOVA, which used when the data failed the assumptions of the one-way ANOVA.

Hypotheses Results

Six hypotheses failed to reject the null hypothesis due to the small sample size of the Silent Generation and Generation Y.

The researcher explained the reasons below:

Null Hypothesis 1: There is no difference between faculty perceptions of technology by generation when developing online courses. Participants answered survey questions 10 and 12 to support a decision to either accept or reject Null Hypothesis 1. For Null Hypothesis 1, the researcher used the Kruskal-Wallis H test to determine a difference in planning for on-ground versus online instructional methods, as well as differences in the ease of use of Canvas for online course development between the four generation groups: The Silent Generation, Baby Boomers, Generation X, and Generation Y. The researcher used a Likert Scale ranging from "strongly agree" to "strongly disagree" for both determinations. Table 3 shows the distribution scores of "Plan" and "Easy" according to each generational group. Distributions of "Plan" scores were not similar for generational groups. There was not a statistically significant difference to suggest more planning required for instructional technology between the generation groups (X^2(3)=2.692, *p*=.442), with a mean rank of 23 for the Silent Generation, 22.38 for Baby Boomers, 25.21 for Generation X, and 32.50 for Generation Y. The *p*-value was .442 (>.05), which failed to reject the null hypothesis.

Distributions of "Easy" scores were not similar for generational groups. There was not a statistically significant difference between variables to reveal easier or less easy for any of the generation groups to use Canvas for online course development ($X^2(3)=4.009$, $p=.261$), with a mean rank of 35.30 for the Silent Generation, 24.07 for Baby Boomers, 22.38 for Generation X, and 22.70 for Generation Y. Due to the *p*-value of .261 (>.05), the researcher failed to reject the null hypothesis.

Table 3

Mean Ranks for Generational Groups: Perceptions of Technology

Items	Generation	N	Mean Rank
Plan			
The use of instructional technology requires more planning than on-ground instructional methods.	Silent Generation	5	23.00
	Baby Boomers	21	22.38
	Generation X	17	25.21
	Generation Y	5	32.50
	Total	48	
Easy			
It is easy for me to use Canvas for online course development.	Silent Generation	5	35.30
	Baby Boomers	21	24.07
	Generation X	17	22.38
	Generation Y	5	22.70
	Total	48	

Null Hypothesis 2: There is no difference between faculty perceptions by generation in the ease of use of technology when developing online courses. Survey questions 10 and 16 through 18 were designed to either verify or reject Null Hypothesis 2. For Null Hypothesis 2, the researcher used the Kruskal-Wallis H test to determine if there were differences in the comfort levels in using instructional technology, such as Canvas and Blackboard as teaching tools and the difficulty in using instructional technology to complete a task among the four generations. The researcher used a Likert

Scale ranging from strongly agree to strongly disagree with both determinations. Table 4 lists the distribution scores of comfort and tasks according to each generational group. Distributions of comfort scores were not similar for generational groups. There was not a statistically significant difference in comfort with using instructional technology as a teaching tool among the generational groups ($X^2(3)=.450$, $p=.930$); with a mean rank of 24.40 for the Silent Generation, 23.90 for Baby Boomers, 25.97 for Generation X, and 22.10 for Generation Y. Due to the *p*-value of .930 (>.05), the researcher failed to reject the null hypothesis.

Table 4

Mean Ranks for Generational Groups: Perceptions for Ease of Use

Items	Generation	N	Mean Rank
Comfort			
I am comfortable using instructional technology as a teaching tool.	Silent Generation	5	24.40
	Baby Boomers	21	23.90
	Generation X	17	25.97
	Generation Y	5	22.10
	Total	48	
Task			
I am able to use instructional technology with little difficulty when I want to complete a task.	Silent Generation	5	28.90
	Baby Boomers	21	26.14
	Generation X	17	21.91
	Generation Y	5	22.00
	Total	48	

Distributions of task scores were not similar for generational groups. There was not a statistically significant difference in the measurements of the difficulty in using instructional technology to complete a task among the generational groups ($X^2(3)=1.785$, $p=.618$), with a mean rank of 28.90 for the Silent Generation, 26.14 for Baby Boomers,

21.91 for Generation X, and 22.00 for Generation Y. Due to the *p*-value of .618 (>.05), the researcher failed to reject the null hypothesis.

The researcher also used a Chi-Square test of independence between the generational types and level of difficulty types. Table 5 reveals not all expected cell frequencies were greater than five. There was not a statistically significant association between generational types and the level of difficulty with instructional technology when developing courses, $X^2(6, N=48)=.1.49$, $p=.960$. The association was small; Cramer's V=.125 and the researcher failed to reject the null hypothesis.

Table 5

Cross Tabulation of Difficulty Level and Generation

Difficulty Level	Generation			
	Silent Generation	Baby Boomers	Generation X	Generation Y
Very Difficult (Detractor)	1 (0.7)	2 (-0.2)	1 (-0.8)	1 (0.7)
Neutral (Passive)	1 (-0.4)	6 (0.2)	5 (0.3)	1 (-0.4)
Very Easy (Promoter)	3 (-0.1)	13 (-0.1)	11 (2.0)	3 (-0.1)

Note: Adjusted residuals appear in parentheses below observed frequencies.

In conjunction with the cross-tabulation of difficulty level and generation in Table 5, the researcher created Table 6 to show the cross-tabulations of the participants' level of difficulty with instructional technology when developing online courses by generation. Participants answered survey question 18 to generate the cross-tabulation statistical analysis. Thirty participants found instructional technology easy to use when developing online courses. Baby Boomers were the largest generation to find instructional technology easy to use, with 13 participants; Generation X was the second-largest generation, with 11 participants; and the Silent Generation and Generation Y were the

smallest generations, each with 3 participants. Regarding the level of difficulty when using instructional technology to develop online courses, 13 participants were neutral. Baby Boomers included 6 participants, Generation X included 5, and both the Silent Generation and Generation Y included 1 participant.

Table 6

Cross Tabulation of Participants' Level of Difficulty with Instructional Technology When Developing Courses by Generation

	Generation				
	Silent Generation	Baby Boomers	Generation X	Generation Y	Total
Level of difficulty with instructional technology when developing courses					
Very Difficult	1	2	1	1	5
Neutral	1	6	5	1	13
Very Easy	3	13	11	3	30
Total	5	21	17	5	48
	10.4%	43.8%	35.4%	10.4%	100.0 %

Null Hypothesis 3: There is no difference between faculty perceptions by generation in the training and support needed to develop online courses. Participants answered survey questions 10, 21 through 27, and 29 to support or reject Null Hypothesis 3. For Null Hypothesis 3, the researcher used the Kruskal-Wallis H test to determine differences among the four generational groups for the following: whether participants wanted more information about instructional technology, such as Canvas, Blackboard, and other instructional technology available for online course development; adequate training for the skills needed to use instructional technology; wanting additional professional development on instructional technology; easily obtaining technical

assistance when coming across an instructional technology-related issue. The researcher used a Likert Scale ranging from strongly agree to strongly disagree for all determinations. Table 7 lists the distribution scores of more information, skills, professional development, technical assistance, in-service training opportunities, and timely assistance according to each generational group.

Distributions of the more information scores were not similar for generational groups. There was no statistically significant difference in whether more information was wanted about instructional technology use for online course development between the generation groups ($X^2(3)=1.978$, $p=.577$), with a mean rank of 27.70 for the Silent Generation, 24.83 for Baby Boomers, 20.56 for Generation X, and 27.80 for Generation Y. Due to the *p*-value of .577 (>.05), the researcher failed to reject the null hypothesis.

Table 7

Mean Ranks for Generational Groups: Perceptions of Training and Support

Items	Generation	N	Mean Rank
More information: I would like more information about instructional technology for online course development.	Silent Generation	5	27.70
	Baby Boomers	21	24.83
	Generation X	17	20.56
	Generation Y	5	27.80
	Total	48	
Skills: I felt adequately trained in the skills needed to use instructional technology.	Silent Generation	5	28.80
	Baby Boomers	21	22.26
	Generation X	17	24.22
	Generation Y	5	25.80
	Total	48	
Professional Development: I would participate in additional professional development on instructional technology.	Silent Generation	5	31.30
	Baby Boomers	21	23.00
	Generation X	17	21.88
	Generation Y	5	27.70
	Total	48	

Technology Assistance: I can easily obtain technical assistance when I come across an instructional technology-related issue.	Silent Generation	5	23.60
	Baby Boomers	21	22.95
	Generation X	17	24.97
	Generation Y	5	20.90
	Total	48	
In-Service Training: Adequate in-service training opportunities are provided by the university.	Silent Generation	5	21.00
	Baby Boomers	21	20.55
	Generation X	17	29.97
	Generation Y	5	22.40
	Total	48	
Timely Assistance: An instructional designer/technologist is available to provide timely assistance when I encounter difficulties using instructional technology.	Silent Generation	5	23.70
	Baby Boomers	21	19.57
	Generation X	17	29.31
	Generation Y	5	25.90
	Total	48	

Distributions of skill scores were not similar for generational groups. There was not a statistically significant difference in being adequately trained on the skills needed to use instructional technology between the generation groups (X^2(3)=1.139, p=.768), with a mean rank of 28.80 for Silent Generation, 22.26 for Baby Boomers, 24.22 for Generation X, and 25.80 for Generation Y. Due to the p-value of .768 (>.05), the researcher failed to reject the null hypothesis.

Distributions of professional development scores were not similar for all groups. There was not a statistically significant difference in wanting additional professional development on instructional technology between the generation groups (X^2(3)=2.574, p=.462), with a mean rank of 31.30 for Silent Generation, 23.00 for Baby Boomers, 21.88 for Generation X, and 27.70 for Generation Y. Due to the p-value of .462 (>.05), the researcher failed to reject the null hypothesis.

Distributions of technology assistance scores were not similar for all groups. There was not a statistically significant difference in easily obtaining technical assistance

for instructional technology-related issues between the generation groups (X^2(3)=.444, *p*=.931), with a mean rank of 23.60 for Silent Generation, 22.95 for Baby Boomers, 24.97 for Generation X, and 20.90 for Generation Y. Due to the *p*-value of .931 (>.05), the researcher failed to reject the null hypothesis.

Distributions of in-service training-opportunities scores were not similar for all groups. There was not a statistically significant difference in whether more information was wanted about instructional technology use for online course development between the generation groups (X^2(3)=4.973, *p*=.174), with a mean rank of 21.00 for Silent Generation, 20.55 for Baby Boomers, 29.97 for Generation X, and 22.40 for Generation Y. Due to the *p*-value of .174 (>.05), the researcher failed to reject the null hypothesis.

Distributions of timely assistance scores were not similar for all groups. There was not a statistically significant difference in whether an instructional designer/ technologist was available to provide timely assistance when encountering difficulties in using instructional technology among the generation groups (X^2(3)=4.998, *p*=.172), with a mean rank of 23.70 for Silent Generation, 19.57 for Baby Boomers, 29.31 for Generation X, and 25.90 for Generation Y. Due to the *p*-value of .172 (>.05), the researcher failed to reject the null hypothesis.

The researcher also used a Chi-Square test of independence between generation types for Canvas function types and support received during online course development. The researcher used a Likert Scale ranging from strongly agree to strongly disagree for all determinations. Table 8 reveals not all expected cell frequencies were greater than five for all variables. There was not a statistically significant association between generation types and the Canvas functions in which participants received support from an

instructional designer during online course development, X^2(18, *N*=90)=23.66, *p*>.166). The association was moderate; Cramer's V=.296, which failed to reject the null hypothesis. There was also no statistically significant association between generation types for receiving enough support with services during online course development: X^2(15, *N*=159)=2.75, *p*=1.000). The association was small; Cramer's V=.076, which the researcher also failed to reject the null hypothesis.

Table 8

Cross Tabulation of Canvas Functions, Canvas Support, and Generation

Canvas Functions	Generation			
	Silent Generation	Baby Boomers	Generation X	Generation Y
Canvas Discussions	1 (-0.5)	6 (0.1)	6 (0.7)	0 (-0.9)
Canvas Assignments	3 (0.8)	9 (0.8)	5 (-0.8)	0 (-1.1)
Canvas Gradebook	1 (0.2)	3 (-0.1)	3 (-0.3)	0 (-0.7)
Canvas Collaborations	1 (0.0)	3 (-0.4)	4 (0.7)	0 (-0.7)
Canvas Quizzes	3 (1.3)	5 (-0.5)	5 (0.1)	0 (-0.9)
Canvas Modules	1 (-0.5)	7 (0.7)	5 (0.1)	0 (-0.9)
Other	1 (-1.0)	7 (-0.8)	6 (-0.6)	5 -4
Canvas Support				
Turnitin	3 (0.3)	11 (-0.6)	10 (0.9)	2 (-0.6)
	3	11	7	2

Canvas Conferences	(0.5)	(0.0)	(0.0)	(-0.4)
	3	15	10	4
Canvas Gradebook	(-0.1)	(-0.1)	(1.0)	(0.2)
	2	16	10	4
Canvas Student View	(-0.8)	(0.3)	(0.1)	(0.2)
	3	11	6	3
Module Restrictions	(0.5)	(0.0)	(-0.5)	(0.3)
	2.00	12	6	3
Canvas Calendar	(-0.2)	(0.5)	(-0.5)	(0.3)

Note: Adjusted residuals appear in parentheses below observed frequencies.

In conjunction with the cross-tabulation of Canvas functions, Canvas support, and generations in Table 8, the researcher created Table 9 to show cross-tabulations, by generation, of other support services received. Participants answered survey questions to generate cross-tabulation statistical analysis. Forty participants did not receive support services other than Canvas Discussions, Canvas Assignments, Canvas Gradebook, Canvas Modules, and Canvas Quizzes. Baby Boomers were the largest generation that received no other services, with 19 participants; Generation X was the second largest generation, with 13 participants; the Silent Generation followed, with 5 participants; and Generation Y was the smallest generation, with 3 participants. Other support services, such as course merging, course copy, Blueprint, McGraw-Hill Connect, course development, adding individuals to Canvas courses, video recording (Big Blue Button), and Turnitin each had a total of one participant.

Table 9

Cross Tabulation of Other Services Where Participants Received Support by Generation

	Generation				
	Silent Generation	Baby Boomers	Generation X	Generation Y	Total
What other services did you receive support for that were not listed?					
None	5	19	13	3	40
Combining Courses	0	0	1	0	1
Copying Content	0	0	1	0	1
Blueprint	0	1	0	0	1
McGraw-Hill Connect	0	1	0	0	1
Developed Own Courses	0	0	1	0	1
Adding Individuals	0	0	0	1	1
Video Recordings, Turnitin	0	0	1	0	1
Total	5	21	17	4	47
	10.6%	44.7%	36.2%	8.5%	100.0 %

Null Hypothesis 4: There is no difference between faculty perceptions by generation in the time needed to learn how to develop online courses. Participants answered survey questions 10 and 32 to either support or reject Null Hypothesis 4. For Null Hypothesis 4, the researcher used a Kruskal-Wallis H test to determine differences in receiving adequate training time to develop an online course(s) among the four generational groups. The researcher used a Likert Scale ranging from strongly agree to strongly disagree. Table 10 lists the distribution scores of training time, according to each generational group. Distributions of training time scores were not similar for all groups. There was not a statistically significant difference in receiving adequate training

time on how to develop an online course(s) among the generational groups (X^2(3)=3.923, *p*=.270), with a mean rank of 30.70 for Silent Generation, 20.07 for Baby Boomers, 25.47 for Generation X, and 29.10 for Generation Y. Due to the *p*-value of .270 (>.05), the researcher failed to reject the null hypothesis.

Table 10

Mean Ranks for Generational Groups: Perceptions of Training Time

Items	Generation	N	Mean Rank
I received adequate training time on how to develop an online course(s) before developing my online course(s).	Silent Generation	5	30.70
	Baby Boomers	21	20.07
	Generation X	17	25.47
	Generation Y	5	29.10
	Total	48	

Null Hypothesis 5: There is no difference among faculty perceptions by generation in the time needed to complete the development of online courses. Participants answered survey questions 10 and 34 to either support or reject Null Hypothesis 5. For Null Hypothesis 5, the researcher used a Kruskal-Wallis H test to determine differences in having adequate time to develop an online course before students enrolled among the four generation groups. The researcher used a Likert Scale ranging from strongly agree to strongly disagree. Table 11 reveals the distribution scores of time development, according to each generational group. Distributions of time development scores were not similar for all groups. There was no statistically significant difference in having adequate time to develop an online course before students enrolled between the generation groups (X^2(3)=3.880, *p*=.275), with a mean rank of 17.80 for the Silent Generation, 21.52 for Baby Boomers, 27.19 for Generation X, and 30.40 for Generation Y. Due to the *p*-value of .275 (>.05), the researcher failed to reject the null hypothesis.

Table 11

Mean Ranks for Generational Group Perceptions of Time to Develop

Items	Generation	N	Mean Rank
I had adequate time to develop my online courses before students were enrolled.	Silent Generation	5	17.80
	Baby Boomers	21	21.52
	Generation X	17	27.19
	Generation Y	5	30.40
	Total	48	

Null Hypothesis 6: There is no difference in faculty members' years of experience, and the frequency of training and support received from an instructional designer. Participants answered survey questions 4 through 8 and 10 to either support or reject Null Hypothesis 6. For Null Hypothesis 6, the researcher used a Chi-Square test of independence between generation types for learning management system types and teaching types, including online, on-ground, hybrid, or a combination of each. A Likert Scale, which ranged from "strongly agree" to "strongly disagree," was used for all determinations. Table 12 reveals not all expected cell frequencies were greater than five for all variables. There was no statistically significant association between generation types and learning management systems used for course development, X^2(12, *N*=180)=4.52, *p*=.972. The association was small; Cramer's V=.092, which failed to reject the null hypothesis. There was, however, a statistically significant association between generation types and the teaching delivery types used for course development, X^2(18, *N*=84)=36.68, p=.006. Though the association was moderately strong; Cramer's V=.382), the researcher can reject the null hypothesis.

Table 12

Cross Tabulation of Learning Management System Type, Teaching Type, and Generation

	Generation			
LMS Type	Silent Generation	Baby Boomers	Generation X	Generation Y
	5	27	24	7
Blackboard	(0.1)	(-0.4)	(0.2)	(0.4)
	9	46	37	11
Canvas	(0.6)	(-0.1)	(-0.4)	(0.4)
	0	2	1	0
Moodle	(-0.5)	(0.8)	(-0.1)	(-0.6)
	0	1	2	0
Schoology	(-0.5)	(-0.4)	(1.1)	(-0.6)
	0	5	3	0
Other	(-0.8)	(1.0)	(0.0)	(-1.0)
Teaching Type				
	1	10	8	0
Online	(-0.7)	(1.4)	(0.0)	(-1.6)
	0	0	0	1
Hybrid	(-0.3)	(-0.8)	(-0.9)	(3.1)
	2	4	2	0
On-ground	(1.6)	(0.7)	(-1.0)	(-1.0)
	0.00	1.00	10.00	1.00
Online & Hybrid	(-1.2)	(-2.4)	(3.2)	(-0.2)
	3	7	8	3
Online & On-ground	(.9)	(-.6)	(-0.4)	(0.9)
	1	0	0	1
Hybrid On-ground	(2.0)	(-1.2)	(-1.2)	(2.0)
	1.00	11.00	7.00	2.00
Online, Hybrid, & On-ground	(-0.9)	(1.4)	(-0.9)	(0.0)

Note: Adjusted residuals appear in parentheses below observed frequencies.

In conjunction with the Table 12 cross-tabulation of learning management system type, teaching type, and generation, the researcher created Table 13 to show the cross-tabulations of participants who developed courses elsewhere, before building online courses at the university. Most participants did not have prior experience developing

online courses elsewhere before developing online courses for the university. Of these participants, there was a total of 31 people. Also, the data showed 13 participants sometimes, barely, or never sought out an instructional designer. The participants did not know instructional designers existed, did not need help from an instructional designer, or understood how to design the courses properly due to experience.

Table 13

Cross Tabulation of Participants' Prior Development, Meeting Frequency, and LMS Use by Generation

	Generation				
	Silent Generation	Baby Boomers	Generation X	Generation Y	Total
Years Prior					
Prior to developing online courses for the university, have you ever developed online courses anywhere?					
No	5	10	11	5	31
Yes	0	11	6	0	17
Total	5	21	17	5	48
	10.40%	43.80%	35.40%	10.40%	100%
How frequently did you meet with an instructional designer/ technologist while developing online courses?					
Always	0	1	0	0	1
Often	2	5	1	0	8
Sometimes	2	4	7	0	13
Barely	0	8	3	2	13
Never	1	3	6	3	13

Total	5 10.40%	21 43.80%	17 35.40%	5 10.40%	48 100%
What other LMS was used?	5	18	15	5	43
None					
WebCt	0	0	1	0	1
Socrates	0	1	0	0	1
UoP	0	1	0	0	1
Loudcloud	0	0	1	0	1
Custom	0	1	0	0	1
Total	5 10.4%	21 43.8%	17 35.4%	5 10.4%	48 100.0%

Re-Analysis for Null Hypothesis 6

The researcher found Null Hypothesis 6 needed retesting to find a difference in faculty years of experience, frequency of training, and support received from instructional designers. As such, the researcher removed each generation from the equation. Participants answered survey questions 5, 6, and 7 to either support or reject Null Hypothesis 6. For Null Hypothesis 6, the researcher used a Chi-Square test of independence and the Kruskal-Wallis H test. The variables used for the Chi Square test of independence were DolAE (developed online courses anywhere else). The variables used for Kruskal-Wallis testing were FreqMeet (Frequency Met within Instructional Designer).

Chi-Square Test of Independence. The researcher conducted a Chi-Square test of independence between participants' years of experience developing online courses for the university and whether participants developed online courses anywhere else before developing online courses at the university. The researcher used a Likert Scale ranging from strongly agree to strongly disagree. Table 14 shows not all expected cell frequencies were greater than five. However, there was a statistically significant

association between years of experience and development of online courses elsewhere: $X^2(3, N=46)=13.19$, $p=.004$. The association was strong, Cramer's V=.535, which rejected the null hypothesis. The researcher noted the results violated one of the test assumptions that all cells should have expected counts equal to or greater than five, so the results may or may not be valid.

Table 14

Cross Tabulation of Developing Courses Online Elsewhere and Years of Experience

DolAE	Years of Experience			
	0–3 Years	4–6 Years	7–9 Years	10+ Years
No	28 (3.6)	1 (-2.5)	0 (-1.3)	0 (-1.9)
Yes	9 (-3.6)	5 (2.5)	1 (1.3)	2 (1.9)

Note: Adjusted residuals appear in parentheses below observed frequencies.

Kruskal-Wallis H Test. The researcher conducted a Kruskal-Wallis H test to determine if there were differences in the years of experience participants had in developing online courses and the frequency with which participants met with an instructional designer/technologist while developing online courses. The researcher employed a Likert Scale ranging from strongly agree to strongly disagree for all determinations. Table 15 reveals the distributions of the frequency of meeting scores were not similar for all groups. There was not a statistically significant difference in the years of experience and frequency of meeting with an instructional designer/technologist ($X^2(3)=3.124$, $p=.373$), with a mean rank of 23.69 for 0–3 years, 27.67 for 4–6 years, 5.50 for 7–9 years, and 16.50 for 10+ years. Due to the *p*-value of .373 (>.05), the researcher failed to reject the null hypothesis.

Table 15

Mean Ranks for Years of Experience

FreqMeet	Years of Experience	N	Mean Rank
How frequently participants met with an instructional designer/technologist while developing courses online.	0–3 Years	37	23.69
	4–6 Years	6	27.67
	7–9 Years	1	5.50
	10+ Years	2	16.50
	Total	46	

Qualitative Analysis

Survey and interview analysis procedure. Fifty-eight people participated in the survey. The researcher removed 10 surveys from the qualitative analysis because nine participants did not develop an online course within the last two years of conducting the study, and one participant did not specify a generation type. The researcher had 48 respondents: 21 Baby Boomers, 17 Generation Xers, 5 Silent Generation, 5 Generation Y (Millennials), and zero Generation Zs. Four people participated in the follow-up interview: two Generation Xers and two Silent Generation.

The researcher analyzed four interview transcripts and an Excel spreadsheet with responses from six open-ended survey questions. NVivo12, "a place to organize, store and analyze your data" ("Qualitative Data Analysis Software | NVivo," 2020, para. 1), was the appropriate analysis tool based on the researcher's questions and the type of data collected. NVivo12 was also used for the round of coding to view emergent patterns from the qualitative data.

The completion of data coding and analysis helped answer the researcher's five research questions. Saldaña (2015) described coding as "essence-capturing and essential elements of the research story that, when clustered together according to similarity and regularity (a pattern), they actively facilitate the development of categories and thus

analysis of their connections" (p. 8). Also, Miles and Huberman (1994) explained coding as "tags and labels for assigning units of meaning to the descriptive or inferential information compiled during a study" (p. 56).

Research Questions Answered through Survey and Interview Analysis

The researcher aligned each opened-ended survey question, aligned with all research questions. The results of the interview question analysis aligned with researcher questions one, two, and three. The five research questions for the mixed methods study included:

Research Question 1: How does each generation perceive technology when developing online courses?

Research Question 2: How does each generation perceive the ease of use of technology when developing online courses?

Research Question 3: How does each generation perceive the training and support needed to develop online courses?

Research Question 4: How does each generation perceive the time needed to learn how to develop online courses?

Research Question 5: How does each generation perceive the time needed to complete the development of online courses?

Open Coding

Open coding enabled the researcher to analyze distinct concepts in the data to develop first-level categories or primary headings and second (third, fourth, etc.) level codes associated with and coded to the primary codes. At the first level of coding, the

researcher looked for distinct concepts in the data to form the basic categories or units of analysis.

Round one coding. The researcher imported interview transcripts into NVivo12 and an Excel spreadsheet for coding. Furthermore, the first review included reading the entire set of interview responses to develop preliminary coding categories. Open coding consisted of using line-by-line and sentence analysis (Strauss & Corbin, 1998). The researcher analyzed first-level codes based on the researcher's five research questions, coding of the interview transcripts, and the open-ended survey questions. The researcher assigned codes, based on the words from each interview question to ensure consistency with the coding and to directly align the answers in the transcripts with the appropriate first-level code. For example, one interview question asked the participants what challenges each faced, why the participants were there, and what the participants did. The code for the question was "challenges."

Similarly, one open-ended survey question asked the participants, "Please describe other perceptions of technology you had during online course development." The code or label for the question was "tech perceptions." Each data source included primary, first-level codes. Gibbs (2007) noted primary, first-level categories as thematic codes to establish a "framework of thematic ideas" for subsequent coding and analysis.

Round two coding. The second round of coding consisted of re-reading each transcript and conducting open coding again. The participants' answers, provided in the text, associated with the primary, first-level codes developed from each data source, generated second-level codes. The coding labels were assigned using NVivo12 codes or words participants used in the interviews; codes or labels were developed directly from a

word, words, or phrases from the coded passages of text. The researcher coded and grouped the data according to similarities. For example, one answer participants shared on challenges faced during online course development was the instructional designers did not teach the philosophy of online teaching. The NVivo12 code assigned to the passages of text was 'not taught philosophy.'

Round three coding. A third review of the coding ensured NVivo12 codes were correctly assigned, and all similar codes collapsed together. A total of 72 codes emerged from the interview data, and a total of 162 codes emerged from the open-ended survey questions. The researcher assigned codes based on the responses of 48 respondents: 21 Baby Boomers, 17 Generation X, 5 Silent Generation, 5 Generation Y (Millennials), and zero Generation Z.

Thematic Analysis of Open-Ended Survey and Interview Questions

Upon the conclusion of the coding process, the researcher implemented a thematic analysis of the survey data by examining the codes to identify common themes. The researcher analyzed the topics, ideas, and patterns in the codes. The researcher identified six emergent patterns from the open-ended survey questions for each generational group.

Upon completion of the survey analysis, the researcher also implemented a thematic analysis of the interview data. The purpose of the follow-up interview analysis was for the researcher to obtain a deeper understanding of the participants' experiences during online course development. Two members of the Silent Generation and two members of Generation X participated in the follow-up interview, creating four total transcripts. The researcher labeled the two Silent Generation participants SilGenP1 and

SilGenP2 to keep participants anonymous. The researcher also labeled the two Generation X participants GenXP3 and GenXP4 to keep participants anonymous.

The thematic analysis involved examining codes to identify common themes. The researcher analyzed the topics, ideas, and emergent patterns in the codes and ran four transcripts through NVivo12 for coding and emergent themes from the two generation participants: the Silent Generation and Generation X. After sending the four transcripts through NVivo12, emerging themes appeared aligned to research questions 1 through 3. The researcher identified four emergent patterns from the interview data analysis for the Silent Generation and identified five emergent patterns from the interview data analysis for Generation X.

Thematic Analysis of Research Question 1

Research Question 1: "How does each generation perceive technology when developing online courses?" Participants answered survey question 14 to help answer Research Question 1. Question 14 stated the following: "Please describe other perceptions of technology you had during online course development." Two Silent Generation and two Generation X participants answered the following interview question: "Describe the indicators, if any, of online course development success."

Silent Generation Themes: Diverse Perceptions of Technology, Nominal Online Course Experience, and Construction to Completion of Successful Projects. Five Silent Generation participants answered survey question 14, and one theme emerged from the survey analysis: diverse perceptions of technology. Silent Generation participants described the perceptions of technology each had during online course development. For example, one Silent Generation participant understood 'using outside

entities such as McGraw-Hill for homework management and ProctorU for test monitoring was not intuitive, and retaining the procedure has at times been difficult.' Furthermore, another Silent Generation participant thought 'tech is not easy to understand' and did not prefer the support from videos on Canvas's functionality. Videos only hindered the Silent Generation participant from asking questions. However, while two responses appeared as a negative perception of technology, one Silent Generation participant had more of a positive perception of technology. The university's IT department, Canvas support, and Canvas Guides were 'very helpful' to the Silent Generation participant during online course development. While most Silent Generation participants perceived technology as unfavorable, some had a positive perception of technology.

Two themes emerged from the Silent Generation interview analysis: nominal online course experience and construction to completion of successful projects. Neither of the Silent Generation participants had built courses before working at the researched university. SilGenP2's family engaged in online courses, which allowed SilGenP2 to learn by observing online coursework.

The construction to completion of successful projects theme described as indicators of success for online course development. Both participants received help from an instructional designer during online course design. SilGenP1 received help from the researcher as an instructional technologist, learning how to use discussions in Canvas properly. As SilGenP1 stated, the 'first year of online course design with discussion boards was tough,' yet with the feedback from students and the help from the instructional technologist, SilGenP1 was able to use discussions properly. SilGenP1 also

understood online learning as ‘the thing of the future,’ allowing SilGenP1 better grasp of teaching online and ‘enjoys doing it.’

After receiving guidance on online course design from an instructional designer at the university along with using YouTube videos to help learn course content, SilGenP2 found ways to engage in online course development, understanding the course was not instructor-led facilitated by a member of the Silent Generation, which SilGenP2 found ‘really important.’ Both found the help received useful and reducing anxiety. Both Silent Generation participants understood online teaching was not instructor-led, but rather instructors served as facilitators in environments where an online presence was essential. Online course-building success meant learning how to use technology in Canvas, gain useful feedback from students, and inserting the students’ personal experiences into the course.

Baby Boomers Theme: Instructor Perceptions. Sixteen Baby Boomer participants answered survey question 14, and one theme emerged from the survey analysis: instructor perceptions. Baby Boomers viewed technology, such as learning platforms for online learning, to be a tool used to enhance the student’s learning experience. For example, a Baby Boomer stated, ‘Technology is a wonderful thing. There are many features and functions you can utilize in online course development, such as discussion boards, video assignments, and online quizzes and exams.’ However, the participant also stated, “technological tools become most effective when designers (instructors) know how to leverage them in multifaceted ways.’ Furthermore, ‘Readiness and positive attitude are necessary to get the most of technology.’

Two Baby Boomers also reported previous work experience in the technology field helped provide a positive perception of technology and allowed one participant to feel 'very comfortable using it.' Other Baby Boomers had a positive experience with technology but thought students struggled with technology, which was a significant concern. One Baby Boomer spent time 'helping students use the online tools, Connect from McGraw Hill, Canvas Conference, ProctorU, Turnitin, and Canvas in general' and said 'what seems intuitively obvious' to the instructor was 'confusing to students.' In contrast, only one Baby Boomer reported 'student progress and interests as much more difficult in an online platform' due to 'preparation for an on-ground class' versus the idea an 'online class has to be more thoroughly developed.'

While the preparation of an online course possibly created negative perceptions of technology, Baby Boomers had a positive perception of technology and technology experience and a willingness to learn, contributing to technology as a positive for online learning. The student learning experience constituted a primary concern for Baby Boomer participants, especially if students struggled with the learning management system or outside technologies integrated into the course.

Generation X Theme: Indubitable Perceptions of Technology, Continuation of Online Course Design Experience, and Building for Success. Seven Generation X participants answered survey question 14, and one theme emerged from the survey analysis: indubitable perceptions of technology. Generation X participants reported positive perceptions of technology. In fact, 'additional changes made' in Canvas created a more comfortable online course-design experience for one Generation X participant. Another Generation X participant maintained 'technology is much more pervasive and

necessary in an online course to offset the interactions one would have on-ground.' However, discussions in online courses were better suited for on-ground, and 'stand-alone items' integrated into Canvas and created a course development setback, as explained by several Generation X participants. One Generation X participant asserted online was better than on-ground.

Two themes emerged from the Generation X interview analysis: continuation of online course design experience and building for success. GenXP4 had online course-building experience before the study at the researched midwestern university, and GenXP4 had a basic understanding of how to create an online course in Canvas at the researched university. However, GenXP4 participated in an eight-week workshop at the researched midwestern university on building online courses and created more than a basic Canvas course. In contrast, the GenXP3 participant had neither academic online course design experience nor was the course ever taught to the participant before. The participant did not have an online course experience before working at the researched midwestern university. However, the participant created and facilitated online seminars. The experience of creating and facilitating online seminars was different from creating academic courses.

The building for success theme described what Generation X participants noted as indicators of success for online course development. A basic understanding of building online courses in Canvas allowed GenXP4 to build a basic online course. However, an eight-week workshop at another institution allowed GenXP4 to achieve a functional online course. Building for success for GenXP4 meant understanding how to use Canvas tools and "making it do many more things." Before taking the 8-week workshop at

another midwestern university, GenXP4 learned the 'nuts and bolts' from the researched midwestern school. Then, when GenXP4 taught online courses for the other school, GenXP4 had 'more mastery of Canvas' due to participation in the 8-week workshop. The participant described the experience in the 8-week workshop as 'learning Canvas as a student while I was building it as an instructor.' GenXP4 was able to create a 'functioning Canvas course' and 'make Canvas' work with the help of IT. The student reviews of GenXP4 were evidence of the course's success. If GenXP4 had not had the additional training, then course delivery would have continuously been basic.

In contrast, the only guidance GenXP3 received when building the online course were meetings on the importance of online courses, the growth of online course design and student participation at other institutions, and the business aspect of online learning. Building for success for GenXP3 could have been better. Starting with a new course never taught at the university was a challenge in itself; GenXP3's colleagues were building existing courses. Having meetings with the department administrator helped GenXP3 understand the importance of online learning, and the business aspect of online learning was essential to GenXP3. However, having 'levels of assistance' when building online courses would have been helpful for successfully building courses.

Generation Y (Millennials) Theme: Prep Time for Online Courses. One Generation Y participant answered survey question 14, and one theme emerged from the survey analysis: more prep time was needed for online courses. Preparation was a concern for Generation Y, but only for the first year of online course design. Otherwise, 'Prep for years after the first would be significantly less.' Due to only one response, the researcher experienced difficulty analyzing Generation Y's perception of technology.

However, based on the response, the researcher concluded an overall positive perception of technology existed. Generation Y would have a negative perception of technology only when building course content for the first time; over time, course development became more manageable.

Thematic Analysis Summary of Research Question 1 for All Generations. In summary, the survey analysis concluded most generations had a positive perception of technology, except for the Silent Generation. The Silent Generation had a negative perception of technology, mostly due to outside factors related to online course design and delivery. Baby Boomers had a positive perception of technology yet shared a concern about the students' learning experience. Generation X was positive about technology, yet agreed with the Silent Generation teaching on-ground was best suited for certain activities that involved interaction with students. Generation Y participants and one Baby Boomer needed more preparation time for online courses than for on-ground courses.

The interview analysis concluded three participants did not have online course experience before teaching at the researched Midwestern university; only GenXP4 had prior online course experience. SilGenP2 saw the production of an online course in action by watching family members who participated in online courses. GenPX3 taught an online seminar but not an academic online course and found the experience challenging, mostly since the course was new. Three participants received online course design assistance from an instructional designer who, along with student feedback, helped contribute to the successful completion of a functional online Canvas course. However, GenXP3 had a challenging time during online course design and wished the

experience was better. Higher levels of assistance could have helped with GenXP3's experience.

Thematic Analysis of Research Question 2

Research Question 2: "How does each generation perceive ease of use of technology when developing online courses?" Participants answered survey question 19 to help answer research question 2. Question 19 asked the following: "Please provide a rationale for your answer in the previous question." The previous question indicated the level of difficulty with instructional technology when developing courses on a Likert Scale from very difficult to easy. Two Silent Generation and two Generation X participants answered the following interview question: "Challenges you faced and why were they there, and what did you do?"

Silent Generation Themes: Facile and Challenging Levels of Difficulty with Instructional Technology and Online Course Design Challenges. Five Silent Generation participants answered survey question 19, and one theme emerged from the survey analysis: facile and challenging levels of difficulty with instructional technology. The conclusion referred to Silent Generation participants who provided a rationale for the level of difficulty with instructional technology when developing courses. The Silent Generation found instructional technology easy to use over time and with practice. However, two Silent Generation participants expressed concerns over 'difficulty grasping the terminology being used,' which could cause some difficulty in using instructional technology. The Silent Generation perceived instructional technology as easy to use, yet the terminology could potentially hinder the online course development experience.

One theme emerged from the Silent Generation interview analysis: online course design challenges. Both SilGenP1 and SilGenP2 shared challenges with building online courses, while SilGenP1 had challenges lecturing in an online course and utilizing Canvas modules. SilGenP1 received course design help from the researcher with lecturing and Canvas modules. SilGenP1 received additional help from the department administrator to follow the department's guidelines and restrictions with the Canvas modules. SilGenP1 figured out course building through the support guides provided by the researcher along with Canvas support calls, trial and error, and additional one-on-one consultation with the researcher.

SilGenP2 shared challenges using technology, such as the computer, and understanding instructional technology terminology, such as "Sandbox": 'I do know what a sandbox is, and I played in it when I was three years old.' Professors used a sandbox created within Canvas, so professors learned to utilize Canvas tools in a separate space instead of a live course with students. Canvas sandboxes allowed the professors to test and become familiar with Canvas tools; since students were not allowed in the sandbox space, professors created a fake course and explored the tools without disturbing the students in the live Canvas course. Student and learning content populated 'Live Canvas courses.' Changes should be made only in the sandbox, so learning was not disturbed in the live courses. Changes from the sandbox were transferred into new live courses before the semester starts. Other issues included inserting the self into the course, as SilGenP2 could in on-ground courses.

Like GenXP3, SilGenP2 wanted to understand the philosophy of online teaching and learning, along with lecturing. SilGenP1 and SilGenP2 found teaching online 'too

narrow,' or limited in content use, whether too little or too much. SilGenP2 overcame challenges while building online courses working with an instructional designer from the university's online department. The instructional designer created a plan for the right amount of content used online, along with inserting the self into the content as well, which made online course design 'Capital C clear for SilGenP2. 'I became less afraid of the program. I became much less overwhelmed.' Another issue with online course design included the 'philosophy of the online course' similar to a Gen X participant and lecturing in online settings.

Baby Boomers Theme: Comfort and Difficulties with Instructional Technology. Sixteen Baby Boomer participants answered survey question 19, and one theme emerged from the survey analysis: comfort and difficulties with instructional technology. Most Baby Boomer participants viewed technology as easy to use. For example, two participants 'have a lot of experience in this technology with multiple platforms,' using instructional technology tools. Furthermore, 'with just a little training' and practice using instructional technology tools, online course development would become more comfortable over time. However, a few Baby Boomers had difficulty with instructional technology. One Baby Boomer mentioned being 'rather new' to developing online courses, which hindered online course design experience. Other Baby Boomers mentioned 'Pairing with McGraw-Hill Connect' or 'Turnitin, Conferences' hindered the online course design experience, especially if the tools like Turnitin and Conferences were 'not obvious.' However, one Baby Boomer stated, 'It is not technology's responsibility to be easy to use; it is my responsibility to be willing to continue to learn.' While some functions could cause difficulties when using instructional technology, Baby

Boomers understood instructional technology was easy to use when paired with a willingness to learn, training, experience, and continued practice.

Generation X Themes: Easy and Challenging Levels of Difficulty and Technical and Philosophical Challenges. Eleven Generation X participants answered survey question 19, and one theme emerged from the survey analysis: easy and challenging levels of difficulty. Generation X found instructional technology easy to use with experience, constant use, and tools being 'fairly intuitive,' 'whether teaching online or on-ground.' However, the time needed to create lectures and methods used for online learning made using instructional technology challenging for a few Generation X participants.

One theme emerged from the Generation X interview analysis, technical and philosophical challenges. GenXP4 participated in an eight-week workshop regarding online course design at another midwestern institution, where the participant learned how to create a functional Canvas online course. Training by 'curriculum designers' and 'seasoned online instructors' allowed GenXP4 to fully utilize the tools in Canvas to do more than create a basic course.

However, GenXP3 did not receive similar course training as GenXP4. The lack of training prohibited GenXP3 from utilizing Canvas tools to the full potential. Other factors of online course design restrictions occurred in which GenXP3 was not comfortable with, such as a lack of understanding behind online learning philosophy and how the experience differed from on-ground. Philosophy of online course design included questions such as, 'What would we need, what do we achieve, [and] what do we

want the students to learn?' Similar to Baby Boomers, GenXP3 wanted to provide a good experience for the students in the course.

Generation Y (Millennials) Theme: Dissimilar Experiences with Levels of Difficulty in Developing Courses. Three Generation Y participants answered survey question 19, and one theme emerged from the survey analysis: dissimilar experiences with levels of difficulty in developing courses. The theme meant Generation Y participants provided a rationale for indicating the level of difficulty with instructional technology when developing courses. Only one Generation Y participant stated the technology was 'pretty easy to use.' However, all Generation Y participants found interpersonal interaction with students to be harder online than on-ground. Two Generation Y participants, when comparing online course design to on-ground, stated in conjunction with interpersonal interaction with students, there were 'advantages/disadvantages in the live version of the class simply due to interpersonal interaction.' Another stated, 'For an on-ground class, discussions can steer the class into different topics that support the topic at hand . . . [for] online coursework, you have to choose the discussions because interactions can take days carefully.' Both quotes demonstrated why Generation Y felt an interpersonal connection with students was harder online than in traditional classroom settings.

Thematic Analysis Summary of Research Question 2 for All Generations. In summary, the survey analysis concluded all generations found instructional technology was easy to use. The Silent Generation needed additional guidance with instructional technology terminology. While terminology could be challenging, Baby Boomers were more concerned with the potential challenges of outside technology or being new to

developing online courses. Lecture creation initiated technology issues for Generation X. Generation Y advocated for the ease of use when incorporating instructional technology; although on-ground appeared more comfortable, Generation Y preferred online due to the interpersonal interactions with students. However, with training and a willingness to learn instructional technology, years of experience allowed for the ease of use of instructional technology.

The interview analysis concluded three participants received online course design help from instructional designers. GenXP4 received ID help from another institution in an 8-week course to create a functional Canvas course. The researcher helped both Silent Generation participants with Canvas tools such as Modules and lecturing online. An additional instructional designer (ID) from the university's online department provided SilGenP2 with additional help with course design. SilGenP1 also received additional help from the department administrator. Both services decreased anxiety in building online courses. The three participants who received instructional design created more than a basic online course and found instructional design useful, with less anxiety. GenXP3 did not receive help from an instructional designer and was unaware of the ID department at the university. GenXP3 relied on research, meetings, and feedback from the department administrator. GenXP3 and SilGenP2 needed training in the overall philosophy behind online course design and teaching. However, GenXP3 was not able to receive an understanding of the philosophy of online course design, while SilGenP2 did work alongside an ID from the university's online department.

Thematic Analysis of Research Question 3

Research Question 3: "How does each generation perceive the training and support needed to develop online courses?" Survey questions 28 and 30 helped answer the question. Question 28 asked the following: "Please describe other support services you would likely need to receive from an instructional designer/technologist during online course development." Question 30 asked the following: "For areas where you did not receive adequate support, what would have been helpful during online course development?" Two Silent Generation and two Generation X participants answered the following interview question: "Did you receive any support from an instructional designer during your online course experience?" If participants answered yes to receiving support from an instructional designer during online course development, the researcher asked the following follow-up questions: "What made a specific support stick, and why did it stick? What do you remember the most about the support you received, and why did you think you remembered that experience?"

Silent Generation Themes: Support Services Needed During Online Course Development, Online Course Development Support, and Leveraging Instructional Designers. Four Silent Generation participants answered survey questions 28 and 30. Two themes emerged from the survey analysis: support services needed during online course development and online course development support. Two Silent Generation participants stated, 'Can't think of any,' while another participant did not want to partake in online course design.

The second theme to emerge was online course development support in which Silent Generation participants who did not receive adequate support described what

would have been helpful during online course development. For example, a Silent Generation participant 'would have enjoyed some information about how much time it will take' and 'would like some understanding how frustrating this process is and where to go to bring this burden down.' Several Silent Generation participants learned how to develop an online course from 'Googling these topics' or contacting Canvas support specialists, which lowered frustration. Two participants did not need any additional services during online course development, and another participant was not interested in teaching online.

One theme emerged from the Silent Generation interview analysis, which leveraged instructional designers focused on whether Silent Generation participants received support from an instructional designer during online course experience. SilGenP1 and SilGenP2 were able to leverage an instructional designer and the researcher, an instructional technologist, to help with online course design.
The instructional technologist was able to provide 'paper materials' to SilGenP1 for creating a lecture using Big Blue Button. Providing SilGenP1 with step-by-step guided materials resulted in SilGenP1 learning 'how to do that pretty well.' Not only did SilGenP1 leverage the instructional technologist with guided materials, yet phone calls and emails 'from time to time' and short demonstrations helped SilGenP1. SilGenP2 was able to work with an instructional designer from the university's online department. The instructional designer was able to 'specifically giv[e] me the scope of where we're going with this and how we're going to go with it and what kind of assistant help is there while we're going there.' The instructional designer made the course design 'clear,' and SilGenP2 'became less afraid of the program.' SilGenP2 was also able to leverage the

instructional designer by coming ‘up with five philosophical statements, five goals, objectives’ to help shape the online course. SilGenP2 used outside learning tools such as YouTube videos to help with the lectures in the online course. Leveraging an ID enabled SilGenP2 to have a clear idea of how to design a course, utilize the lecture tools, and integrate tools such as YouTube to build online courses. Valuable one-on-one training with IDs and provided materials helped SilGenP1 and SilGenP2 understand how to use the technology during the online course design experience, making the experience less stressful.

Baby Boomers Themes: Recommendations for Instructional Designer Support and Problems with Online Course Development Support. Twelve Baby Boomer participants answered survey questions 28, and 16 answered question 30. Two themes emerged from the survey analysis: recommendations for Instructional Designer Support and problems with online course development support. The Recommendations for Instructional Designer Support theme covered the opinions of Baby Boomer participants who described other support services faculty would likely need to receive from an instructional designer/technologist during online course development. For example, most Baby Boomers asserted ‘Additional training or information would have been helpful,’ such as ‘Canvas Updates’ and ‘a course mentor who was in the same time arena as an adjunct.’ Another Baby Boomer suggested instructional designers facilitating workshops should ‘slow down and explain every step,’ knowing the information taught may not be ‘intuitive’ to all participants.

The problems with the online course development support theme meant Baby Boomer participants who did not receive adequate support described what would have

been helpful during online course development. Communication regarding course design was problematic. One Baby Boomer stated, 'There is little to no communication provided. Design a course. That's it. Is there a model, a look?' Another problem involved work schedules; adjunct faculty members found it hard to receive help with online course development due to work schedules and limited time. There was a self-paced training module designed to help full-time and adjunct faculty, who were new to online learning, learn how to develop an online course in four weeks. However, one Baby Boomer confirmed 'four weeks is too much for those working outside of the school.' Another Baby Boomer responded, 'I would have come to a series of Saturday workshops.' A lack of information that could help with online course design was a significant issue for Baby Boomers and a lack of support for faculty members on campus or adjunct members away from campus.

Generation X Themes: Technical and Designer Support Needed, Online Course Development Help, Contrasting Views of Instructional Design Support, and Path to Improvement. Eight Generation X participants answered survey questions 28 and 11 and answered question 30. Two themes emerged from the Generation X survey analysis: technical and designer support needed and online course development help. The technical and designer support needed theme meant Generation X participants who described other support services would likely need to receive help from an instructional designer/technologist during online course development. For example, all Generation X participants would like to speak with instructional designers about technical and design needs, such as the need for consistent "standards and techniques" across the university and fulfill the 'university wants/expects' for online course design. Generation X

participants would like the option of speaking with an instructional designer in a ‘chat room set up with a Canvas Specialist to guide in real-time,’ ‘one-to-one training,’ or a phone call.

The second theme was online course development help, which meant Generation X participants who did not receive adequate support described what would have been helpful during online course development. Five Generation X participants did not need support with the topics mentioned in the survey: Turnitin, CC, Grades, Student View, Modules, and Calendar. However, two Generation X participants needed either ‘assistance with the mundane aspects of course development’ or with adding streaming options in Canvas from DVD shown in on-ground courses. Information on university standards and techniques for building online courses would be helpful for Generation X, along with ways to incorporate on-ground technology into Canvas, and help on items seeming mundane to the full-time and adjunct faculty.

Two themes emerged from the Generation X interview analysis: contrasting views of instructional design support and path to improvement. Overall, GenXP4 was able to receive instructional design help due to attending an 8-week course at another Midwestern institution. GenXP3 was not able to receive help from an ID during the online course design. However, both participants were able to receive help from fellow full-time and/or adjunct faculty. GenXP4 was able to work with other full-time and/or adjunct faculty and ‘share tips and best practices’ during the 8-week workshop. Faculty meetings, interactions with the department administrator, and help from a faculty member helped GenXP3 during the online course experience. However, GenXP3 had little help and feedback from the department administrator and faculty due to busy

schedules. Unlike GenXP4, GenXP3 would have preferred to 'sit down one-on-one with a course designer just to go through things and make sure I had it right.' The path to improvement theme was the additional comments and commentary that Generation X participants provided about their online experience.

GenXP4 did not have additional comments or commentary, possibly as a result of receiving the instructional design support for GenXP4's online course. However, the path to improvement for GenXP3 meant understanding the student population at the university to build an online course properly. Like the Baby Boomers, GenXP3 focused on the students' experience and 'what they get out of my class.' For GenXP3, caring about student success was the top priority. However, GenXP3 did not have the support of an instructional designer and suggested providing available assistance would help those struggling with online course design. Lastly, group meetings helped GenXP3 understand the reality and business aspects of online learning in universities.

Generation Y (Millennials) Themes: Disparate Needs for Support Services and Desired Support Services. Two Generation Y participants answered survey question 28, and one answered question 30. Two themes emerged from the Generation Y survey analysis: disparate needs for support services and desired support services. The disparate needs for support services theme meant Generation Y participants who described other support services (Canvas tools, integration of other tools in Canvas) would likely need to receive assistance from an instructional designer/technologist during online course development. From the few Generation Y participants, there was a difference in responses. One Generation Y participant felt 'adequately trained on online course development,' while the other Generation Y participant did not, mainly regarding

'lecture recording' and 'design help.' The desired support services theme meant Generation Y participants who did not receive adequate support described what would have been helpful during online course development. One Generation Y participant wanted to learn not only the functions of Canvas but also 'what makes an online course effective,' yet overall received adequate Canvas support during online course development.

Thematic Analysis Summary of Research Question 3 for All Generations. In summary, the survey analysis concluded all generations needed information to help develop a course for online students. However, lack of communication and consistency of online course design and expectations appeared problematic. Available help on course design outside of regular business times during the week could help adjunct faculty, primarily due to busy schedules. Full-time and adjunct faculty also needed course design help through the following: training, one-on-one consultation, phone calls, or an online chat.

The interview analysis concluded Silent Generation only had one theme emerge from the interview analysis: Leveraging Instructional Designers. In contrast, Generation X had two emerging themes: Contrasting Views of Instructional Design Support and Path to Improvement. GenXP4 received ID help from another institution in an 8-week course to create a functional Canvas course. GenXP3 did not receive help from an ID and relied on research, meetings, and feedback from the department administrator and faculty; this resulted in contrasting views of the online course design experience from GenXP4 and GenXP3. GenXP3 did not receive instructional designer support, which resulted in the Path to Improvement theme in terms of how GenXP3's online course experience could be

improved, mainly with course designer assistance and feedback from the student population, in hopes of providing the best experience for GenXP3's students' learning experience. The researcher helped both Silent Generation participants during online course design and additional instruction from the university's online department. The Silent Generation focused mainly on leveraging instructional designers to help complete online course design.

Thematic Analysis of Research Question 4

Research Question 4: "How does each generation perceive the time needed to learn how to develop online courses?" Survey question 33 helped answer the research question. Question 33 stated the following: "Please provide an explanation to the answer in the previous question." The previous question (32) stated the following: "I received adequate training time on how to develop an online course(s) before developing my online course(s) on a Likert Scale from Strongly agree – Strongly disagree."

Silent Generation Theme: Sufficient Training for Online Course Development. Three Silent Generation participants answered survey question 33. One theme emerged from the Silent Generation data analysis: sufficient training for online course development. Two Silent Generation participants either disagreed or strongly disagreed about sufficient training received during online course development. The Silent Generation participant who disagreed noted having 'to work my way through it on the front end and then to be told what I did wrong.' The Silent Generation participant who strongly disagreed was new to online course design.

In contrast, one Silent Generation participant strongly agreed the participant received sufficient training during online course development. The participant stated,

‘one-on-one training was always available when I needed it, and numerous seminars were available as well.’ Two Silent Generation participants disagreed about whether there was sufficient training for online course development due to very little or no guidance on online course development. One participant agreed that he/she had received sufficient training for and access to online course development and webinars.

Baby Boomers Theme: Inadequate Training and Guidelines. Twelve Baby Boomer participants answered survey question 33. One theme emerged from the Baby Boomer data analysis: inadequate training and guidelines. A few Baby Boomer participants agreed, somewhat agreed, or strongly agreed about receiving adequate online course development training. The Baby Boomer participants who strongly agreed, however, attended several training sessions and one-on-one consultations with trainers focused on online course design. Nevertheless, one Baby Boomer participant argued training was only the beginning for online course design: ‘It takes doing, making mistakes, and trying again to see if it worked. Then, a bit more training, trying it out by doing, etc.’

The Baby Boomer participants who somewhat agreed also attended trainings. What made the data analysis theme inadequate training was the Baby Boomers who somewhat agreed claimed the training was “basic” while the others felt, of the number of attendees at the boot camp, not all ‘were on the same level of training. This made it confusing for beginners.’ One Baby Boomer who agreed the experience allowed for adequate online course development claimed, ‘If I had not had the experience though, I would not have been able to participate fully in the actual design of the course.’ While several Baby Boomers agreed on receiving adequate training, there were several who

either disagreed or strongly disagreed on adequate training for online course design. The Baby Boomer who disagreed had not had much training from an instructional designer, yet had ‘a few weeks to redesign the online course with a new textbook and the associated Connect technology,’ and strict guidelines for running the course online. The Baby Boomer strongly disagreed due to ‘no written guidelines’ from midwestern university or the departments within schools, or ‘no primary contact to answer questions or give guidance.’ The training was adequate for a few Baby Boomers, and the training helped them begin the online course design. However, training could be inadequate if the pieces of training had different levels of full-time and/or adjunct faculty confusion, such as those who were beginners at online course design or had no set guidelines for online course design.

Generation X Theme: Sufficient and Inefficient Training. Nine Generation X participants answered survey question 33. One theme emerged from the Generation X data analysis: sufficient and inefficient training. The sufficient and inefficient training theme referred to Generation X participants who provided a rationale concerning whether Generation X participants received adequate training before developing their online course. Codes which contributed to the theme included teaching oneself how to build courses online, the training not sufficient, no infrastructure, building online courses for the first time, having adequate time, and training that happened too early prior to online course design.

Several Generation X participants either somewhat disagreed or strongly disagreed several Generation X participants received inefficient training. One Generation X participant stated they either ‘received very little to no training. When training

provided, training was too quick and incomplete.' Another Generation X participant suggested inefficient training was due to meeting 'the needs of faculty who were are at so many different levels of understanding.' However, several Generation X participants suggested receiving sufficient training. Both participants had training, yet the one Generation X participant who strongly agreed was training while doing online course building completed as a team. The other Generation X participant who agreed received training months before online course development. The Generation X participant argued, 'we should get our course assignments and take the training. If we have the training fresh in our minds, then we can develop effective skills to use in the future.' To Generation X, sufficient training meant training while building online courses with other team members and not months before the online course building. Inefficient training for Generation X was due to training with full-time and/or adjunct faculty at different levels of knowledge of online course design and receiving little to no training before online course building.

Generation Y (Millennials) Themes: Training Barriers for Online Course Development. Three Generation Y participants answered survey question 33. One theme emerged from the Generation Y data analysis: training barriers for online course development. A Generation Y participant who did not have training barriers during online course development had training questions that 'were promptly addressed.' However, a Generation Y participant who had training barriers argued, 'There was no real training available for designing a course.' Generation Y participants claimed training barriers could be resolved with facilitated training while addressing questions promptly, yet training in course design would suffice.

Thematic Analysis Summary of Research Question 4 for All Generations. All generations benefitted from training before building an online course, but only if the training focused on building online courses rather than the functions of Canvas. Also, training would be beneficial if sessions were divided into different levels of online course design experience causing less confusion for beginners. Instructional designers needed to complete training before course design, with support services readily available upon request.

Thematic Analysis of Research Question 5

Research Question 5: "How does each generation perceive the time needed to complete the development of online courses?" Participants answered survey question 35 to help answer research question 5. Question 35 stated the following: "Please provide an explanation to the answer in the previous question." The previous question (34) stated the following: "I had adequate time to develop my online courses before students were enrolled" on a Likert Scale from strongly agree to strongly disagree.

Silent Generation Theme: Adequate Time Developing an Online Course. Two Silent Generation participants answered question 35. One theme emerged from the Silent Generation data analysis: adequate time developing an online course. The theme meant the Silent Generation participants who provided a rationale were concerned with adequate time to develop the online course before the university enrolled students. Codes who contributed to the theme included adequate time for online course development and having no time restraints when building an online course. Both Silent Generation participants strongly agreed adequate time given during online course development was

due to the department's administration giving "adequate time" before the semester start date.

Baby Boomers Theme: Time Barriers in Online Course Development. Ten Baby Boomer participants answered survey question 35. One theme emerged from the Baby Boomer data analysis: time barriers in online course development. Several Baby Boomers strongly agreed time barriers were not a factor in online course building due to having 'several months before course delivery.' One Baby Boomer somewhat agreed because the Baby Boomer participant was 'not prepared for how many hours of work were required to develop an online course.' However, another Baby Boomer strongly disagreed about which time barriers were factors during online course building because 'a complete course, with resources, references, branding, dialogue, rigor, standards, and on and on … takes time to create.' Lastly, another Baby Boomer neither agreed nor disagreed with the time barriers could be an issue because time barriers varied when 'there is rarely enough time to develop the course before the next term fully. Some were added late, which hurried the production.' Time barriers in online course development were a problem for half of the Baby Boomer participants and not a problem for others. A few Baby Boomers confirmed adequate time was given for course development, while a few other Baby Boomers felt there was not adequate time delivered prior to courses starting.

Generation X Theme: Adequate and Inadequate Time for Course Development. Seven Generation X participants answered survey question 35. One theme emerged from the Generation X data analysis of adequate and inadequate time for course development. Three Generation X participants either strongly agreed or

somewhat agreed Generation X participants had adequate time for course development. Those participants who strongly agreed stated there was adequate time for course development because the ‘university has been proactive’ and ‘the academic calendar was a guide.’ One Generation X participant somewhat agreed Generation X participants had adequate time for course development because ‘fall classes are easier to develop because you have the summer months. Spring is harder to fit in new course development while still maintaining your current courses.’ However, three Generation X participants either somewhat disagreed, disagreed, or strongly disagreed. One Generation X participant strongly disagreed due to having an ‘online developer [who] was very behind schedule in uploading my course content.’ The same participant expressed the course was ‘given the course for review on the Friday before the course began on Monday. It was very stressful.’

Another Generation X participant somewhat disagreed with having adequate time for online course development because ‘students gain access to an online course weeks before classes start; in a traditional class, student[s] would not have access until the class begins.’ The Generation X participants who disagreed with having adequate time said reasons include ‘deadlines for updates can also be unrealistic sometimes.’ Overall, one theme emerged from the Generation X data analysis for adequate and inadequate time for course development. To Generation X, adequate time for building online courses meant the university created adequate time and guidance for the academic year. Conversely, inadequate time for Generation X meant receiving course reviews at the last minute or students’ gaining access to courses two weeks before the courses began.

Generation Y (Millennials) Theme: Time for Developing an Online Course. Three Generation Y participants answered survey question 35. One theme emerged from the Generation X data analysis: time for developing an online course. One Generation Y participant perceived Generation Y participants had time to develop an online course while one disagreed, and a third neither agreed nor disagreed. One Generation Y participant 'had plenty of time to develop the material.' The Generation Y participant who somewhat agreed 'had about 3 to 4 weeks to get it completed from start to finish.' The Generation Y participant who neither agreed nor disagreed stated time depended 'on the course and how quickly the school needs it to be available for enrollment ... I've had too little time and just enough time.' Overall, one theme emerged from the analysis: Generation Y participants confirmed there was adequate time given to develop the online course before student enrollment, depending on the course and completion date.

Thematic Analysis Summary of Research Question 5 for All Generations. All generations confirmed the time given to complete courses was adequate before student enrollment controlled by the university. Certain generational groups noted enough time given due to university contributions, administration within departments, the academic calendar, and receipt of the course months before the semester. However, if certain generational groups claimed the lack of adequate time, the perception was due to unrealistic course delivery due dates, receipt of courses at the last minute for either course review or course building, and early student access to courses.

Summary of Chapter Four

Chapter Four provided the quantitative and qualitative results of the researcher's mixed-methods analysis of generational perceptions of faculty who developed online

courses. The researcher used 48 analysis variables, including frequencies, cross-tabulations, the chi-square test of independence, and the Kruskal-Wallis H test. The 48 variables included 5 Silent Generation (Traditional), 21 Baby Boomer, 17 Generation X, and 5 Generation Y (Millennial) participants. However, due to the small sample size, a violation of assumptions occurred when running the chi-square test of independence, resulting in several test statistics not significant for the variables. The results violated one of the test assumptions that all cells should have expected counts equal to or greater than 5, which means that the results may or may not be valid. Additionally, the researcher ran the Kruskal-Wallis H test for all 12 dependent variables, but the distributions were not similarly shaped; therefore, inferences could not made about the differences in medians between the groups (i.e., perceptions, ease of use, training, and support, and adequacy of training on the median generation scores). The score distribution was not similar for the groups, and judgments were made based on the differences in the distributions. The tests for all 12 dependent variables were not significant, indicating that the distributions of the variable scores were not different between the generation groups. The p-value for each was greater than .05 ($p>.05$).

The qualitative analysis consisted of open-ended questions within the survey for the Silent Generation (Traditional), Baby Boomer, Generation X, and Generation Y (Millennial) participants. Interviews of two Silent Generation and two Generation X participants revealed similar themes according to ease of use, training and support, the time needed to learn, and online course development. Generations that were mostly new to online course design needed help from an instructional designer. Learning the Canvas (including how to create assignments, discussions, and quizzes) was helpful. Professors

want instructional designers to teach them to use Canvas tools to make Canvas do more and provide the best learning experience for students. Chapter Five discusses the research findings, recommendations for the university regarding better leveraging of instructional designers for online course help, recommendations for future studies, and the significance of COVID-19 for online learning.

Chapter Five: Discussion and Reflection

Introduction

The purpose of the study was to conduct a mixed-methods examination of perceptions of faculty who developed online courses, organized by generation. The researcher focused on the following concepts: technology, ease of use of technology, training and support, and the time needed to learn and develop online courses. Perceptions from each generation depended on years of online course development and the frequency of using an instructional designer in which the researcher also examined. The researcher examined full-time and/or adjunct faculty from four schools: the School of Professional Studies (SPS), the School of Education (SOE), the School of Arts (SOA), and the School of Business (SOB).

To examine generational faculty perceptions during online course development, 48 participants participated in a survey consisting of 36 Likert scale questions and six open-ended questions. Of the 48 participants, 5 were Silent Generation (Traditional), 21 were Baby Boomers, 17 Generation X, and 5 Generation Y (Millennials). The researcher identified specific themes for each research question after analyzing the open-ended survey response and participant interview data.

The researcher analyzed quantitative data defined as forced-choice responses from the survey, using descriptive statistics, cross-tabulations, a Chi-Square test of independence, and a Kruskal-Wallis H test. The researcher failed to reject the null hypotheses 1 through 6:

Null Hypothesis 1: There is no difference between faculty perceptions of technology by generation when developing online courses.

Null Hypothesis 2: There is no difference between faculty perceptions by generation of the ease of use of technology when developing online courses.

Null Hypothesis 3: There is no difference between faculty perceptions by generation of the training and support needed to develop online courses.

Null Hypothesis 4: There is no difference between faculty perceptions by generation of the time needed to learn how to develop online courses.

Null Hypothesis 5: There is no difference between faculty perceptions by generation of the time needed to complete the development of online courses.

Null Hypothesis 6: There is no difference in the faculty years of experience, and the frequency of training and support received from an instructional designer.

The researcher retested Null Hypothesis 6. Only a few of the components rejected the null hypothesis.

The researcher developed five research questions for the mixed methods study:

Research Question 1: How does each generation perceive technology when developing online courses?

Research Question 2: How does each generation perceive the ease of use of technology when developing online courses?

Research Question 3: How does each generation perceive the training and support needed to develop online courses?

Research Question 4: How does each generation perceive the time needed to learn how to develop online courses?

Research Question 5: How does each generation perceive the time needed to complete the development of online courses?

The data analysis tool, NVivo12, assisted the researcher code and sought emergent patterns for the qualitative data. Emergent patterns aligned with each question according to the results of the survey and interviews. The open-ended responses from the survey were analyzed separately from the interview responses and categorized by research questions and each generation.

Full-time and Adjunct Faculty Need Instructional Designers and Instructional Tech

After reviewing the qualitative results in Chapter Four, the analysis concluded full-time, and adjunct faculty needed instructional designers and instructional technologists. Full-time and adjunct faculty who utilized an instructional designer or an instructional technologist experienced less stress during online course development. Full-time and adjunct faculty experienced in online course design could utilize an instructional designer and instructional technologist to help further utilize Canvas functions in conjunction with other instructional technologies to create more than a basic Canvas course. Also, full-time and adjunct faculty with no experience in online course design utilized an instructional designer and instructional technologist to help learn Canvas functions. Once comfortable using Canvas, they could incorporate other instructional technologies to build an engaging course.

However, full-time and adjunct faculty who received no help from an instructional designer and instructional technologist, mostly full-time and adjunct faculty new to online course design, experienced frustration. Adjunct faculty who were mostly new to online course development experienced much frustration and relied on monthly department meetings to receive help from full-time and adjunct faculty experienced with online course design. Finding additional time to collaborate with other experienced full-

time and adjunct faculty and administrators became frustrating and allowed for missing essential design elements in the online course design.

Full-time and adjunct faculty needed instructional designers and instructional technologists to learn how to build courses properly. From the study results, participants found training allowed other full-time and adjunct faculty to collaborate and share experiences with online course development. From experience, the researcher found full-time and adjunct faculty training to be helpful because full-time and adjunct faculty received hands-on experience and asked pertinent questions to help with course development.

Full-time and adjunct faculty needed instructional designers and instructional technologists to help with external barriers. External barriers included the following: time needed to learn how to develop a course online, the time needed to develop an online course, training and support from an instructional designer and instructional technologist during online course development, and outside instructional technologies like Turnitin and McGraw Hill. In the study, full-time and adjunct faculty mentioned helping students with technology issues regarding outside technologies, such as McGraw Hill Connect and Turnitin, integrated into Canvas. From experience, the researcher was able to help students with outside technologies.

Years of Experience Matters for All Generations

The quantitative results presented in Chapter Four demonstrated no significant difference could be found in how each generation viewed the following perceptions: technology, ease of use of technology, training and support, and the time needed to learn and develop online courses. The researcher failed to reject null hypotheses 1 through 5

supporting the perceptions due to the small sample size. The researcher, however found only a few components of hypothesis 6 rejecting the null hypothesis.

However, qualitative data from open-ended survey responses and interview responses could support the frequency of use and instructional design difference with the number of years of experience in building online courses. Full-time and adjunct faculty members with no online course development experience relied extensively on instructional design support, especially those unfamiliar with Canvas. The researcher worked with full-time and adjunct faculty new to online course building and met with full-time and adjunct faculty weekly, either by phone, Zoom, or office visits. Once the full-time and adjunct faculty had become comfortable with using Canvas and other technologies integrated into Canvas, the researcher, in the role as an instructional designer, met less with the full-time and adjunct faculty. Instead of visiting weekly, full-time and adjunct faculty visits gradually decreased to a few times within a 16-week semester.

Learning Characteristics of Silent Generation and Generation X

In Chapter Two, the researcher mentioned the characteristics of each generation in conjunction with learning experiences. Wiedmer (2015) outlined a few learning characteristics for the Silent Generation, which included a preference for instructor-led classes and recognized individual achievements such as certificates or trophies. Traditional instructor-led learning characteristics were the only characteristics observed when the Silent Generation met with the instructional technologist when learning how to build online courses. The Silent Generation training experience mostly occurred face to face. Walking through course design in a few meetings seemed to work well for the

Silent Generation. Workshop facilitators distributed paper guides upon the completion of training and one-on-one sessions used for reference. The only issue with instructor-led meetings with individual full-time and adjunct faculty were meetings became time-consuming, taking away from the instructional designer's and instructional technologist's other duties, mostly if the instructional design team was small.

Also, Blevins (2014) outlined a few learning characteristics of Generation X, which included little to no interaction with classmates, an enjoyable learning environment, hands-on learning, role-playing, and the use of technology. Hands-on learning and the use of technology learning characteristics were understood to be the characteristic observed by the researcher when one Generation X participant met with an instructional designer and curriculum designer for an eight-week workshop at another Midwestern University. The eight-week workshop included hands-on experience and collaboration with other full-time and adjunct faculty who were new or experienced with online course design. As a result, Gen XP4's experience suggested Generation X's learning characteristics could have altered Gen XP4's learning experience. Nevertheless, instructor-led meetings and hands-on training applied also to Baby Boomers. From experience, the researcher assisted Baby Boomer faculty with instructor-led training during facilitated workshops.

The Impact of COVID-19

The researcher discussed COVID-19 because COVID-19 related to the researcher's study concerning seeking support from an instructional designer or instructional technologist. As the pandemic did not occur during the researcher's study, the researcher deemed the pandemic was essential and looked at how COVID-19 altered

the Midwestern University. From observation, regardless of the generation, full-time or adjunct faculty would seek an instructional designer or instructional technologist support, especially if the generational faculty members who had little to no online course design experience

The emergent Coronavirus disease 2019 (COVID-19) in Wuhan, China, in December 2019, was a new strain of the coronavirus that caused respiratory illness. Adults 65 years or older, and people who had medical conditions were at high risk of catching COVID-19 (CDC, 2020; Johns Hopkins, 2020). COVID-19 spread from person to person through close contact when droplets from coughing, sneezing, or talking were "inhaled into the lungs" (CDC, 2020). People infected by COVID-19 had symptoms of coughing, shortness of breath, and fever. To slow the spread of COVID-19, people were encouraged to stay at home or practice social distancing when in public (CDC, 2020; Johns Hopkins, 2020). As a result, COVID-19 forced those in K–12, postsecondary education, and corporations to work from home.

How the Research Cite Responded to COVID-19. The researched Midwestern private university was one of many universities to move courses from on-ground to online. On March 11, 2020, the university's president decided to move all courses online for two weeks. The pandemic worsened, and on March 16, 2020, the university president decided to continue all courses virtually for the remainder of the spring semester (Office of the President, personal communication, March 11, 2020; personal communication, March 16, 2020). Full-time and adjunct faculty, staff, and students were told to remain off campus starting March 23, 2020. Only essential workers, such as public safety and janitorial services, were allowed on campus (Public Relations, personal communication,

March 21, 2020). In response to the university's decision to move courses online, the faculty had one week to adjust the courses before returning from spring break.

Overall, the researcher perceived the university's transition as smooth, even within a short timeframe. Most professors had experience teaching online, and the university's online department helped with the transition by creating quick start guides and videos of Canvas tools and integrations, such as creating assignments and quizzes, Conference, Speedgrader, and discussions; and using Microsoft Teams. The online department also worked alongside the University's library staff. The library staff created a webpage with helpful virtual classroom learning materials and provided information about how the University virtually supported student and full-time and adjunct faculty needs. The online department also worked with the researched University's professional development department. The professional development department created a full-time and adjunct faculty discussion forum with questions regarding teaching courses virtually. The Helpdesk developed an online chat on the University's website, so full-time, adjunct faculty, and students could access Canvas or other technology needs during the transition to virtual classrooms.

Observations During the Transition. The researcher observed the transition from on-ground to online courses created by the COVID-19 pandemic. The researcher noted the few worried professors, mainly those who never taught online, and wanted to ensure full-time and adjunct faculty were supported. The researcher noted where support mainly needed from professors during the transition. Full-time and adjunct faculty mainly used Canvas Conferences using Big Blue Button integration for asynchronous or synchronous lectures. From observation, most professors needed support using Canvas

Conferences with Big Blue Button to keep an on-ground feeling virtually. However, professors had to keep in mind, when doing a synchronous lecture, students might not meet the University's online technical requirements for hybrid and online courses and may be unable to participate in a live discussion on Big Blue Button. Some requirements included having a computer with a webcam, proper operating systems for a PC or a Mac computer, internet, and specific software ("Researched University Online," 2020).

Some professors found slow rendering time after recording Big Blue Button lectures, due to the numerous institutions or companies possibly using Big Blue Button to record lectures. Instead of a rendering time of 30 minutes or less, some Big Blue Button lectures rendered after a day. Big Blue Button and Canvas Conferences added closed captioning to recordings. However, with the quick turnaround, professors had no time to handwrite transcripts to add within the programs. The solution to adding closed captioning to videos was to record and download the video from Canvas Conferences, then upload the video to YouTube. Professors using the solution to upload videos to YouTube had to keep in mind that YouTube does not always have accurate closed captioning. Closed captioning accommodated all students for virtual learning yet benefited students with special accommodations addressed by the university's student center.

Professors who typically conducted written exams on-ground needed to move exams online. Departments in the sciences conducted written lab exams in which students were to identify objects in lab stations. Instead, professors used images and uploaded them into Canvas. Quizzes structured as essay exams. Courses such as statistics would possibly have to use the "file upload" option in Quizzes, so the professors

could see student work when solving statistical problems. Last, professors had to learn how to grade discussions and quizzes that were normally on-ground in Speedgrader to grade student submissions efficiently. Professors experienced high-volume calls when contacting Canvas support due to support calls from other institutions using Canvas.

Recommendations from the Transition. While the university had a smooth transition in a short period, the researcher observed what the university could have done better to prepare. The researcher agreed with many other professors that the university should have extended spring break. Extending spring break would have given professors more time to prepare their on-ground course for virtual learning, as virtual learning preparation takes time. The researcher believes the researched university should have conducted more research about tools that helped accommodate students with special learning needs, such as programs that allowed closed captioning and other programs that worked within the university's budget. The university should have considered updating the minimum use requirements for Canvas, regardless of whether a professor is teaching in person or online. The university's minimum requirements included learning how to use the syllabus, assignments, gradebook, and calendar tabs in Canvas. Instead, all in the researcher's opinion, professors should require to use all Canvas tools. Should a pandemic like COVID-19 occur again, professors should be more knowledgeable about quickly and easily moving courses to a virtual format.

What COVID-19 Taught Universities. Any professor seeking employment in higher education should have strong technical and online teaching skills, and all schools (and disciplines) should have tools that help with online learning. Universities should consider researching affordable online learning tools to support science, statistics, and

any other courses requiring labs or show-your-work problems. All universities and colleges should invest in a sound learning management system, such as Canvas, catered to in-person, and online student experiences. Finally, full-time and adjunct faculty were unaware that instructional designers and instructional technologists existed until the COVID-19 pandemic started; instructional designers and instructional technologists were more critical than ever before. The researcher also recommended that universities invest in instructional design teams and corresponding training for full-time and adjunct faculty working with instructional technologies in online course design. Universities needed to publicize the existence of instructional designers and instructional technologists and explore other forms of communication for full-time and adjunct faculty.

Recommendations for Future Study

The researcher had several recommendations for those who wish to replicate or enhance the study. The small sample size of the Silent Generation (Traditional) and Generation Y (Millennial) populations obstructed the statistical analysis portion of this study. As suggested by the psychology department, researching the whole university instead of four departments could have helped with the statistical analysis. The researcher also suggested studying only the Baby Boomer and Generation X populations, perceived as the largest groups teaching in higher education. The researcher also suggested researching traditional students who moved to online courses. The School of Professional Studies (SPS) forced to move all courses online, forcing the students who were part of SPS also to move online.

Understanding the traditional students' perceptions of taking courses online, in comparison to on-ground, could have potentially helped universities and professors in the

way online learning approached. Lastly, the researcher suggested doing a post-COVID-19 research study of full-time and adjunct faculty, staff, and students. The post-COVID-19 survey could have focused on the transition from on-ground to virtual learning and what the university could do better to prepare.

Conclusion

After analyzing four different generations—the Silent Generation, Baby Boomers, Generation X, and Generation Y—the researcher found no differences in the following perceptions: technology, ease of use of technology, training and support, and the time needed to learn and develop online courses. Generational faculty who had little to no online course development experience frequently sought assistance from an instructional designer and instructional technologist. Data analysis revealed instructional designers and instructional technologists were relevant to staffing in higher education, as instructional designers and instructional technologists provided online support for full-time and adjunct faculty. Support was evident in the COVID-19 pandemic situation and demonstrated the importance of instructional designers and instructional technologists.

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Appendix A: Survey and Follow-up Interview Questions

List of survey and follow-up original and revised interview questions from the researcher's study.

Learning and Developing of Online Courses Survey link
Learning and Developing of Online Courses

Follow up interview questions (original)

1. What Generation are you?
2. Describe the type of support you received if any from the instructional designer.
    - If you received support, how often was support received and from whom?
    - What do you remember the most about the support you received and why did you think you remembered that experience over another?
    - If you did not receive any support during online course development, what type of support would you have liked to receive?
    - Describe the indicators if any, of online course development success.
3. Describe your experience in developing online course work.
4. Describe any instructional technology resistance you experienced, if any, during the transition.
    - What was the cause of resistance if you experienced any during the transition?
    - How was the instructional designer able to assist during your experience with instructional technology resistance?

- If you experienced any resistance, describe any reasons for the resistance during the transition?
- Describe the support you received, if any, from the instructional designer or organization during the transition.

5. Anything else you would like to add in response to developing online courses/coursework?

Follow up interview questions (final – after IRB approval)

Updated Interview Questions for Study:

- What Generation are you?
- Are you new with online course design or had prior experience?
- Did you receive any support from an instructional designer during your online course experience?
    - What made a specific support stick and why did it stick? What do you remember the most about the support you received and why did you think you remembered that experience?
- Challenges you faced and why were they there and what did you do.
- Describe the indicators if any, of online course development success.
- Anything else you would like to add from your online experience that we did not cover?

Vitae

JeLena Fleming has a background in graphic and web design and took an interested in instructional technology and instructional design. Her degrees obtained focus on graphic and web design. Her Bachelor of Arts degree was in communication with a minor in studio art and a visual communication technology certificate. The Bachelor of Arts degree was obtained from Saint Louis University. Her first Masters was a Master of Fine Arts in Studio Art emphasizing in computer graphics and web design from Lindenwood University. Her second Masters was a Master in Arts with an emphasis in digital media also from Lindenwood University.

JeLena began her career as a User Experience Web Graphic Designer working for a Fortune-500 company. While working at the fortune-500 company, JeLena grew an interest in training. She also at this time adjunct at several universities teaching graphic design. In October 2016 she left the fortune-500 company to work for several universities working as an instructional technologist and instructional designer.