Introducing Digital Educational Tools into a Traditional Liberal Arts Education Program:

An Exploratory Case Study

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Abstract

A liberal arts education prepares students for a successful career by providing the tools for critical thinking, performance in a team setting, and drawing awareness of and connections to different social, economic, political, and demographic differences in the larger society (Weis, et al. 2002). Traditionally, the delivery of a liberal arts education has been a face-to-face lecture/discussion/research format with little to no incorporation of technology. With the availability of digital tools for teaching and learning and the pervasiveness of digital tools in the lives of the students that colleges serve, liberal arts faculty over time have been presented with an opportunity to introduce digital tools into their instruction and assessment. However, the degree to which faculty members incorporate digital tools into their liberal arts classrooms and the perceptions of faculty members regarding how this process impacts their teaching and students’ learning remains unclear (Georgina & Olson, 2008, p. 2). In this context, the purpose of this descriptive case study was to explore the experiences of liberal arts faculty at a private, Midwest College as they incorporate digital tools into their teaching and to document how faculty members and administrators made sense of how to use digital tools and related pedagogies to impact student success.

Keywords: digital pedagogy, blended learning, liberal Arts, instructional technology, TPACK
Table of Contents

Chapter 1: Introduction
- Statement of the Problem .......................................................... 8
- Context and Background .............................................................. 9
- Significance of the Research Problem ......................................... 20
  - Figure 1: Decline in humanities degrees from 2012 to 2014 ........... 21
- Deficiencies in the Evidence ......................................................... 25
- Relating the Discussion to Audiences .......................................... 26
- Research Questions ........................................................................ 28
- Positionality Statement ............................................................... 28
- Theoretical Framework ................................................................. 29
  - Figure 2: TPACK theoretical framework ................................... 29
  - Content Knowledge (CK) ......................................................... 31
  - Pedagogical Knowledge (PK) ................................................... 32
  - Technological Knowledge (TK) ............................................... 34
  - Pedagogical Content Knowledge (PCK) .................................... 34
  - Description of the framework .................................................. 35
  - Rationale for choosing the TPACK framework ....................... 36
  - Alignment of the TPACK framework to the study .................... 36
- Limitations ................................................................................. 40

Chapter 2: Literature Review ............................................................ 42
- Introduction ................................................................................. 42
- History of Liberal Arts Colleges ................................................... 43
  - Summary ................................................................................. 47
- Blended Learning ......................................................................... 48
  - Summary ................................................................................. 54
- Digital Tools Available to Liberal Arts Faculty ............................. 54
  - Retrofitting the curriculum ...................................................... 56
  - Incorporation of digital tools by liberal arts faculty .................. 57
  - Summary ................................................................................. 61
- Conclusion .................................................................................. 61

Chapter 3: Research Design .............................................................. 62
- Introduction ................................................................................. 62
- Research Questions ...................................................................... 62
  - Subquestion 1 .......................................................................... 62
  - Subquestion 2 .......................................................................... 62
  - Subquestion 3 .......................................................................... 62
  - Subquestion 4 .......................................................................... 63
- Research Paradigm ...................................................................... 63
- Research Design ......................................................................... 64
- Research Tradition ...................................................................... 66
- Participants ................................................................................. 68
Recruitment and Access .................................................................................................................. 69
Data Collection ................................................................................................................................. 69
  Survey ........................................................................................................................................ 69
  Interviews .................................................................................................................................. 70
  Archival research and document analysis ..................................................................................... 71
Data Storage ...................................................................................................................................... 71
Data Analysis ..................................................................................................................................... 72
  Analysis of the survey results ......................................................................................................... 72
  Analysis of the interview transcripts ............................................................................................. 72
Trustworthiness ................................................................................................................................... 75
Protection of Human Subjects .......................................................................................................... 76

Chapter 4: Results of Findings ......................................................................................................... 77
Introduction ....................................................................................................................................... 77
Research Questions ............................................................................................................................ 77
  Subquestion 1 ................................................................................................................................. 77
  Subquestion 2 ................................................................................................................................. 77
  Subquestion 3 ................................................................................................................................. 77
  Subquestion 4 ................................................................................................................................. 77
Participants ......................................................................................................................................... 78
  Administrators ............................................................................................................................... 78
  Faculty members .......................................................................................................................... 79
  Table 1: Faculty Member Participants ......................................................................................... 79
Findings ............................................................................................................................................... 80
  Survey results ............................................................................................................................... 80
  Interviews .................................................................................................................................... 80
  Superordinate theme 1: Infrastructure ......................................................................................... 82
    Internet access ........................................................................................................................... 82
    Summary .................................................................................................................................... 85
  Superordinate theme 2: Educational technology ......................................................................... 86
    iPad introduction ......................................................................................................................... 86
    Software ...................................................................................................................................... 87
    Summary .................................................................................................................................... 87
  Superordinate theme 3: Instructional technology ......................................................................... 88
    Student engagement .................................................................................................................... 88
    Student/faculty resistance ........................................................................................................... 90
    Summary .................................................................................................................................... 93
Answering the Research Question ................................................................................................. 93
  Subquestion 1 ............................................................................................................................... 94
  Subquestion 2 ............................................................................................................................... 94
  Subquestion 3 ............................................................................................................................... 95
  Subquestion 4 ............................................................................................................................... 95
Summary ............................................................................................................................................ 97
Conclusion .......................................................................................................................................... 97
Chapter 5: Discussion of the Findings

Introduction

Topic Revisited

Summary of the Findings related to the Central Research Question
  Faculty members’ perspectives
  Administrators’ perspectives

Discussion of Findings Aligned to the Research Subquestions
  Subquestion 1
  Subquestion 2
  Subquestion 3
  Subquestion 4

Discussion of Findings in Relation to the Literature Review

Discussion of Findings in Relation to the Theoretical Framework

Implications for Practice
  Implications for faculty
  Implications for administrators
  Implications for students and parents
  Implications for small liberal arts colleges

Implications for Future Research

Summary

Limitations

References

Appendix A: Letters of Invitation to Participate

Appendix B: Letter of Informed Consent

Appendix C: Survey Questions

Appendix D: Survey Results

Appendix E: Interview Questions

Appendix F: Interview Coding Results
Chapter 1: Introduction

In a properly automated and educated world, then, machines may prove to be the true humanizing influence. It may be that machines will do the work that makes life possible and that human beings will do all the other things that make life pleasant and worthwhile.

— Isaac Asimov, *Robot Visions*

Liberal arts education is a system of higher education designed to foster in students the desire and capacity to learn, think critically, and communicate proficiently; a major goal is to prepare them to function as engaged citizens. A liberal arts education is distinguished by a flexible curriculum that allows for student choice. It demands breadth, as well as depth, of study. It is also distinguished by a student-centered pedagogy that is interactive and requires students to engage directly with critical texts and analyses within and outside of the classroom. Colleges with strong liberal arts programs have positive student classroom participation, effective study habits, and strong academic performance, realized through a “seamless learning environment” which includes multiple sources of interdependent and reinforcing student experiences not always found in other types of higher education institutions (Seifert, et al., 2008, p. 110).

Students who participate in liberal arts programs are exposed to learning experiences that support them in obtaining employment after graduation. Sagan, Dallem and Lafferty (2000) noted the strong value of a liberal arts education in hiring percentages post-college; they emphasized that the value of internships and other “hands-on” experience should also be included in the employment discussion related to the benefits of the liberal arts approach (p. 755). Additionally, Seifert et al. (2008) found that liberal arts graduates are attractive to employers because they learn the qualities of effective moral reasoning, ethical principles, problem solving, and sensitivity to diversity, among other attributes (p. 122).
While computers, tablets, and smart-phones permeate the lives of students and instructors outside a class setting, Saavdra and Opfer (2012) noted that the traditional lecture/discussion/assignment mode, which incorporates few if any technological tools, remains the primary mode of instruction in many liberal arts institutions (p. 9). These authors listed nine 21st Century learning goals they deemed vital for successful liberal art student-instructor interactions. The first eight described the traditional liberal arts approach: “make it relevant; teach through the disciplines; develop thinking skills; encourage learning transfer; teach students how to learn; address misunderstandings directly; treat teamwork like an outcome; foster creativity” (p.11). The ninth, however, urged the transition that is the focus of this study: “exploit technology to support learning” [emphasis added] (p. 11). The opportunity here is to reconcile concerns of segments of the faculty about the application of technology in a traditional liberal arts setting, and encourage instructors and staff comfortable with advanced learning tools to share their expertise with those who are concerned about adapting technology and interactive programs. This study asserts that institutions must both honor their past of critical pedagogy grounded in the Socratic methods of lectures and teacher-student interaction, yet incorporate technology and the accompanying pedagogy as fundamental elements of renewal.

**Statement of the Problem**

Despite employer endorsement of the liberal arts approach, it has become increasingly clear that, without an intentional effort to incorporate technology to support learning, as scholars and media analysts have observed, liberal arts programs risk an incapacity to serve what students perceive as their comprehensive educational and job market needs for the future, where integrative technology skills play a significant role (Prensky, 2001, p. 2). Students want
technology on demand, likely including it in their class settings. However, that is only a piece of the larger puzzle many colleges face as digitally native students arrive on campus.

A survey published in *eCampus News*, stated that private colleges and universities are among the top 50 higher education institutions actively engaged in social media usage (Barbour, 2016). The author noted that Baylor University, a private liberal arts institution, is ranked number one in the nation of colleges and universities using Facebook. Faculty, staff and students at these institutions are using Facebook and Twitter (the two social media sources cited) on a consistent basis. In an interview with *Good Call Education News* (Williams, 2015), Provost David Bolman of the University of Advancing Technology in Tempe, Arizona, stated, “Technology in the classroom is a reality. Its presence at educational institutions and within the hands of students is one of the greatest enhancements to the learning process that has occurred in our lifetimes.” Jonathan Holiman, a lecturer in Communications at Southern Utah University, added in the same report: “Technology is now a student’s companion. We need to teach people to teach this generation, they have to teach in the student’s language. Their phones are the friends they can use to your advantage as a professor” (p. 3). Though the tools are available and apparently widely used in many institutions of higher education, particularly by students, their place in liberal arts studies remains unclear, at least in some quarters.

Mouasher and Lodge (2015) noted that the pedagogy of learning programs and the technology used to deliver those programs often do not harmonize, initially. As technologies are rarely designed with teaching and learning in mind, when such an operational/technological approach drives pedagogical strategy, then pedagogy and learning activities also become fixed by the chosen delivery mode (Mouasher & Lodge, 2015, p. 274). The authors cited Mishra and Koehler’s (2006) description of the approach known as Technological, Pedagogical, and Content
Knowledge (TPACK) as a model, noting that the three main aspects of learning environments—content, pedagogy, and technology—must exist in a state of continuous dynamic equilibrium or tension (p. 275). Mishra and Koehler (2006) later addressed the issue of the conflict of learning environments and TPACK. As the authors noted, technologies often come with their own imperatives that constrain the content that has to be covered and the nature of possible representations. These decisions have a ripple effect by defining, or in other ways, constraining, instructional moves and other pedagogical decisions. So it may be inappropriate to see knowledge of technology as being isolated from knowledge of pedagogy and content (Mishra & Koehler, 2006, p. 62).

College faculty members in general have varied interests in technology and its application, and they hold diverse opinions regarding how and to what extent it can serve their coursework. Yet, incoming students in liberal arts settings commonly come from K-12 classrooms laden with technology—sometimes even supplied or required (Noguchi, 2017). Research has shown that students expect their K-12 digital experiences, which are increasingly sophisticated, to be extended into the liberal college classroom environment (Noguchi, 2017; Prensky, 2011). This gulf of application of technology challenges both professors and students as a school year begins. This dilemma is the focus of this study. Most students who seek out a liberal arts education were born after 1980 and are considered digital natives (Prensky, 2001, p.1). Students regularly use digital tools in their personal lives; consequently, they may simultaneously expect a traditional liberal arts lecture-discussion-assignment experience, whether or not technology and applied pedagogy are available (Magarayan et al., 2011, p. 438).

A survey by Engagement Labs eValue, published in eCampus News (Bethke, 2016) indicated that potential and current students expect continual online engagement addressing
academic needs and campus life. Engaged students use Facebook and Twitter most often to obtain information from the institutions, and expect this information to be timely, interesting and entertaining. *Good Call Education News* (Williams, 2015) reviewed a survey conducted by Vital Source Technology and Wakefield Research indicated that 34% of students participating said the greatest benefit of using digital textbooks is affordability; 31% of students said digital textbooks are more convenient. Additionally, 61% of students affirmed that homework that is more interactive, containing elements such as video, would improve their learning process. The survey continued by stating that 48% of students said their learning would be enhanced by technology helping them collaborate digitally with other schools; 61% cited the ability to exchange instant feedback with professors as something that would improve learning; and 55% indicated that digital learning that personalizes their learning experience (that gives teachers the ability to track student progress in real-time, for example) would be useful. Measured by survey responses, students anticipate and appreciate – and to a large extent, expect -- digital integration in the college classroom (p. 3).

In this context, the purpose of this doctoral thesis was to explore the experiences of faculty and administrators of a liberal arts college in the Midwest who were embracing the challenge of incorporating digitally based learning into their educational practices and institutional structure. It is based on the documented premise (Balkun, 2011) that increasingly a “digitally literate” (p. 16) generation of students would benefit from a deeper integration of technology with traditional liberal arts pedagogy. This descriptive case study examined the experiences of faculty and administrators negotiating this perhaps competing set of demands from the global market in which students seek employment.
On one hand, as research has documented, the market, students, and parents value the analytical depth and the development of critical thinking that liberal arts education provides; however, the tension persists to assure that graduates are simultaneously skilled in the most up-to-date technological practices and applications and that these are integrated consistently into liberal arts pedagogy. Buzzard, Crittendon, Crittendon, and McCarty (2011), quoting Strauss and Hill (2007), noted that about half of marketing students surveyed in a particular program were not interested in using web-based tools in their class work. Strauss and Hill (as cited in Buzzard et al., 2011) concluded:

This begs the question as to whether or not students prefer simplicity in their use of instructional technology tools or even if there is a saturation point at which more tools demand too much time and energy for the knowledge gained in the end (p. 132).

The issue of technology as an integral part of classroom practice is not about whether it will happen, but when, and how instructor resistance may be addressed and overcome. Barbour (2016) described the experience of Fresno State University in creating integrated technological underpinnings for learning as the institution moved away from the “sage on the stage” traditional liberal arts classroom scenario by involving all the players, instructors, technology specialists, and equipment suppliers, to work toward a smoother integration of a blended technological approach to instruction. The study aimed to answer why changes are occurring, and how the digital tools enhanced the liberal arts lecture/discussion model (p. 4). The study confirmed the benefits of having faculty and staff focused on identifying specific technical and operational challenges in coursework, rather than simply introducing technology for its own sake. Otto Benavides, interviewed by eCampus News (Barbour, 2016), was the director of the Instructional Technology and Resource Center for the School of Education and Human Development at
Fresno State University, and one of his ongoing responsibilities was to assist faculty members who were struggling with technology and its application to become oriented to use digital tools being installed in classrooms. During training sessions, for example, Benavides broke faculty members into groups and gave them a team task to complete. One exercise involved collaboratively researching various South American countries online and then creating a presentation. While Benavides (Barbour, 2016) monitored their progress and provided assistance as needed, he found: “At the end of the session, everybody knew how many buttons there were, they knew how to get into the Mac, and they could select the Wi-Fi for this or that (p. 3).” And, he recalled: “We never talked about Wi-Fi. We never talked about Apple TV. We just talked about the way to share what they were doing.” As opposed to “sage on the stage” pedagogy, the university considered the training and mentoring a “guide on the side” (Barbour, 2016, p. 3).

While the tradition of lecture/discussion/assignment/test remains a linchpin of traditional liberal arts, questions remain:

- Who determines whether technology is needed, appropriate, or useful in a liberal arts setting? Administration? Faculty? Students and parents? Some combination?
- How will costs for purchasing identified technology, training, and software be addressed?
- Do all faculty members have to “buy in,” or will adaptation be a choice?

These are the undercurrents in the discussion over liberal arts instruction, with or without digital education products in the classroom.

Despite these pressures for movement forward, acceptance of unfettered or even ample use of technology in the classroom in liberal arts settings is not universal. Writing in Inside Higher Education, Straumsheim, (2016) reported on a study at West Point where, over an academic year, professors in a group of classes allowed total use of technology during their
meeting, other classes permitted varying degrees of technological use, and one forbid technology use during class. The third group reported better academic performance. This was at odds with older studies such as those reviewed by Georgina and Olson (2007) that noted that many scholars have focused on the technological aspects of digital-based learning, as opposed to student learning outcomes. Georgina and Olson (2007) further noted research confirming that high-level technology users perceived a greater benefit in introducing and utilizing technology than did low-level users (p. 3). Although Benson et al. (2002), raised questions regarding systemic evidence that computer-related instruction actually produces effective learning (p. 142), the emerging literature has focused on demonstrated and effective learning outcomes primarily in K-12 settings.

Beyond reticence of faculty to adopt technology and questions of equity regarding students’ individual access to equipment, three very concrete limiting factors may contribute to unsuccessful integration of technology in a liberal arts setting. First, sheer lack of financial resources in a small institution – for infrastructure including hardware and software, and training – can affect the willingness and capacity for adaptation. In a study of the landscape of small liberal arts colleges in the digital education world, Alexander and Davies (2012) noted that one issue limiting integration is the paucity of “digital humanities centers” which serve as a repository for digitally stored art and literature resources, a commodity which may be available only at larger institutions (p. 370) Dahlstrom (2015) reviewed survey findings of faculty from a select group of institutions, and reported that the respondents acknowledged adequate availability regarding IT support in technology issues, but less training for support staff, including teaching assistants (p. 8). The survey also showed strong agreement that the success of these institutions
resulted from supporting technology training for faculty, as well as a strong professional development protocol in the integrated use of that technology (p. 10).

Thus, a lack of capacity for professional development training for faculty in small settings is a second major hurdle, particularly because of the pace of change in technology and its applications. As Mishra and Koehler (2006) stated:

Teachers will have to do more than simply learn to use currently available tools; they also will have to learn new techniques and skills as current technologies become obsolete. This is a very different context from earlier conceptualizations of teacher knowledge, in which technologies were standardized and relatively stable. (p. 1018)

In this context, finding the right fit between course content and technological application presents a third challenge, especially in a liberal arts setting. Administrators and faculty must keep in mind the limitations presented by Mishra (2012), which included the rapid pace of technological change, inappropriate design of software, the situated nature of learning, and the incapacity of some coursework to lend itself to digital learning.

Simply installing technology without determining its appropriateness for instructor-student engagement, and not taking a wider view of the integration of those materials in a course plan, may not be beneficial in reaching course goals and in promoting successful classroom interaction (Mishra and Koehler, 2006, p. 1033). One possible reason for this misfit could be that the industry producing pedagogical instructional materials does not fully or effectively work in concert with instructors or with diverse enough interdisciplinary groups of them. As Lin and Ha (2009, p. 567) noted, citing earlier studies on technology application in the classroom by Daft and Lengel, (1984, 1986), the consistent adaption of evolving technology, both hardware and
software, to the changing needs of instructors requires substantial resources both for infrastructure and ongoing professional development.

Combined, these three factors exist in the context of the problem of varying levels of digital literacy competencies amongst faculty, which presents a challenge to college administrators. For example, there may be situations where an instructor is not comfortable introducing non-traditional media in a traditional class setting. Another faculty member may be advanced in their capacity to integrate digital tools, but not have the equipment and resources to do so. Administrators and technology leaders at small colleges must balance these different needs on often limited budgets.

Research at the K-12 level has found that one solution to this is collaborative learning amongst faculty. In their survey of the reactions of elementary and secondary instructors to technology training provided as part of their classroom technological preparation, Morsink et al. (2010) found that less tech-savvy teachers acquired a deeper level of skills when they had hands-on exchanges with more tech-proficient colleagues who assisted them with feedback and information in technological, content knowledge and direct application. This professional growth through collaboration provided these respondents with a level of advancement and technological confidence to allow them to problem-solve in the classroom and also then step into the role of sharing their newly acquired knowledge with even less tech-savvy colleagues (Morsink et al., 2010, p. 14).

Blended learning, in which the student learns partially through the delivery of content and instruction via digital and online media combined with a traditional lecture and discussion approach, may be the bridge from a face-to-face lecture-discussion-driven liberal arts setting, and a more extensively immersed technology-driven learning mode. This combination has the
potential to bridge the demands students and the global market simultaneously placed on liberal arts institutions to combine development of critical thinking skills with sophistication in emerging and existing education software and technology. Blended learning is explored in-depth in Chapter 2.

However, a brief introduction to the approach is important to the framing of the problem addressed in this study. Buzzard et al. (2011), citing Robinson (2006), documented the connection between the use of instructional technology and positive classroom outcomes. Students who had a positive reaction to the introduction of technology in their learning environment had better overall academic performance. As students perceived that new instructional technology would increase the probability of goal attainment, they were more likely to have a positive attitude toward the technology (p.132). Benson et al. (2002) cautioned that technology does not determine learning outcomes; rather, results are shaped by the choices that faculty, students, and others make about the objectives, content, and pedagogy that give meaning to and/or constrain those choices (p.141). Blended learning, the authors noted, has the potential to provide a context for effectively “inverting the classroom” because it allows faculty and students with different learning styles to “collaborate, conduct group research and problem solving tasks, with education technology at the core of the learning mode” (Benson, 2002, p. 143). The authors added that further research is needed to determine the effect of approaches such as blended learning on learning processes with technology in play.

**Context and Background**

The college is a four-year degree-granting liberal arts institution, founded by a Catholic monastic order in the mid-1800s. Its origins lay in training young men for the priesthood, as well as lay life, but it expanded its student population in the 1970s to include women who had been
attending a private college in the same town, opening a second institution. The two colleges consolidated co-educationally in 1981. Undergraduate degrees, at the time this study was conducted, were being offered in philosophy, theology, education, foreign languages, English, history, business, economics, engineering, mathematics, computer science, basic sciences, art, architecture, nursing, psychology, sociology, and journalism. Course offerings had expanded since the college merged with its women’s counterpart 35 years prior ago. The college awarded more than 400 degrees at its 2015 commencement ceremony, from fields such as the sciences and theology, to music and journalism. These degrees included general education course requirements in about a half dozen concentrations, with the choice of dozens of courses that satisfied the requirements. The research site course catalog outlines the path to completing the “core course” requirements: each student must complete coursework in philosophy, theology, the sciences, and mathematics, as well as coursework addressing “person and community,” “natural world,” and “arts inquiry.” The continued enrollment growth at the college suggested that students enrolled and their families believe in the financial and intrinsic value of a liberal arts degree.

As a traditional liberal arts institution, instruction had remained, with some exceptions, concentrated on a lecture-discussion-assignment mode. However, iPads were issued system-wide in 2015 to professors, with the intention that they would seek out applicable lesson aids and multimedia and interactive programs to enhance their coursework. It remains unclear, however, whether or not and to the extent to which these units were introduced in the classroom or used as out-of-class teaching tools. Given the number of digital tools most students bring to campus at the start of the school year, the challenge for the faculty and administrators was to consider what, if any, digital education tools and applications are appropriate to enhance both teaching and
student research methods through a deeper incorporation of technology blended with the traditional liberal arts model. Thus, this study, by focusing on one liberal arts college, explored the challenge posed by Delialioğlu (2012) to understand more deeply how blended learning and other non-traditional instructional methods are increasing in usage and which methods are most effective as faculty and students engage in the classroom environments that evolve in the coming years (p. 320).

College administrators at the institution under study and at similar colleges across the United States face complex choices in addressing the emerging demand by students and faculty for access to and use of digital tools, and the insistence from traditional liberal arts faculty (and students) that their classroom methods and practices be sufficient in satisfying the “love of learning” without technological intervention. A Hobbesian solution, simply mandating technological use in all classes, is unworkable and likely violates the tenets of academic freedom. Yet, students bring a multitude of technology to campus each year. Harnessing those phones, tablets, and laptops with current learning tools and dynamic, innovative pedagogical applications, while at the same time retaining the depth acquired through a traditional liberal arts approach, puts these campuses at a crossroads.

**Significance of the Research Problem**

Nationally, while liberal arts degrees remain popular, the percentage of degrees awarded in the humanities has dropped. Jaschick (2016), writing in *Inside Higher Education*, referenced a report from The American Academy of Arts and Sciences, which showed an 8.7% decline in humanities degrees from 2012 to 2014, nationwide.
Within the broader humanities discipline, the number of degrees in English and history fell by 8% and 12%, respectively. The study also revealed that archeology and classical studies were down 19% during that period (Jaschick, 2016, p. 2). These figures are bolstered by information from the National Center for Education Statistics showing the same decline in liberal arts degrees from 2003-2004 and from 2013 to 2014, along with a large increase in the percentage of business degrees awarded.

While these percentages seem to bode ill for liberal arts institutions in general and certain programs in particular, there is still a considerable demand for individuals with liberal arts degrees. The *Chronicle of Higher Education* reviewed a report from an employment search firm reinforcing the argument that “soft skills,” such as writing skills and the ability to present an argument in a cogent fashion, are strongly valued by employers, if they are supported by
exposure to data-analysis or management skills (Blumenstyk, 2016, p. 1). Blended learning has gained ground among instructors in liberal arts institutions, including the University of North Carolina. As described to another reporter from the Chronicle of Higher Education (Young, 2016), faculty preparing for hybrid and online courses there learned how to prepare coursework for an classroom previously bereft of technology and have understood how the spontenity of a traditional classroom can be ported to and transformed by a virtual setting. As one instructor stated, “I don’t expect hyper-efficiency when I teach face to face… I see that the anxieties of adding online instruction to my teaching responsibilities — OK, they’re valid — but I can’t allow those anxieties to get out of proportion,” (Young, 2016, p. 1).

Traditional liberal arts institutions are equipped, in varying degrees, with technology designed to present lecture material and other multi-media programs. In some cases, what is lacking in the classroom is a true digitally-based interactive system designed to expand students’ and professors’ learning capabilities and experiences. This lack of available technology may be due to budgetary constraints or a lack of support staff. The absence of learning technology may also be due to resistance from faculty members, rooted in a determination to continue presenting in a traditional lecture/discussion format, free from any technological tools. There may be a hidden fear of the unfamiliar -- and the possibility of embarrassment if and when there is a technical failure or the incapacity to use new tools.

The availability of emerging digital technology meets the reality of usability, cost, support, and applicability to the community outside the college boundaries. As Prensky (2001) noted, students and faculty are moving from “digital immigrant” status, that is, lacking familiarity with digital tools, to “digital native” status; they exhibit a higher comfort level around hardware and software, and, potentially, more confidence in implementing digital education
programs in the classroom than even many professors (p.2). Balkun (2011) presented questions that must be addressed as technology meets pedagogy in a liberal arts setting: Is the technology supporting learning or is it just a gimmick? How do we know the technology is improving learning? What ethical issues arise—intellectual property concerns, plagiarism, and so on? Does the technology result in active student engagement or passive observation of effects created by others? How do we address economic and other inequities that may impede access to the technology and to learning? Including these issues as discussion points as enhanced technology is introduced is a must.

The nature of teaching and learning in a liberal arts setting may be disrupted by not only technological innovation, but also by the reaction of faculty and student end-users. Benson et al. (2002) observed that when the introduction and/or expansion of digital technology is promoted as a socialization and learning enhancement tool, the instances of students responding with more meaningful and thoughtful interactions increase. (p. 143). In their study of emerging technologies and faculty acceptance of those technologies, Georgina and Olson (2008) explained the success of so-called “blended” courses as the most successful approach to integrating technology into pedagogy (p. 2). Additionally, students’ attitudes towards their perception of what a liberal arts education entails may be evolving. For the student who may have difficulty expressing themselves in the traditional classroom, digital learning may produce cogent and relevant online responses; their concern about their classroom interactions may be mitigated thanks to the third-party mechanisms of an online forum (Benson et al., 2002, p. 143). Some faculty, however, may consider the use of digital tools, such as laptops, telephones, and tablets in the classroom a distraction. Also at issue are concerns about equity and equal access to digital devices, which students might be required to obtain before they set foot on campus.
Angeli and Valanides (2008) argued that critical thinking falls into two categories, the general approach with a focus on teaching general critical-thinking skills separately from subject matter, and the infusion approach that calls for them teaching of general critical-thinking skills embedded in subject matter (p. 323). Rosenberg and Koehler (2015) meanwhile, pointed to the authors’ work as a basis for attempting to classify learning styles based on external factors, such as technology (p. 187). Exploring this dynamic is important because it may give insight into how to best to educate the digital native (Prensky, 2001). Students who use technology in their non-academic life might feel disconnected or disengaged using a traditional pedagogy (Benson, et al., 2002, p. 142). The Vital Source Technology-Wakefield Research study affirmed student interest in enhanced education technology in and out of the classroom, with 61% responding that they were interested in instant feedback with their professors through technology, and 55% responding that digital learning personalizes their learning experience (VitalSource, 2015, p. 2). Within a 21st Century context, it will be important for students and faculty alike to learn how to communicate and collaborate using digital tools (Damico and Bailden, 2011, p. 234).

In this context, a descriptive case study that explores the experiences of liberal arts faculty members with different technology abilities and/or interest as they negotiate diverse levels of incorporation of more technology-based lesson materials, and the experiences of administrators working to implement these changes, makes both practical and theoretical contributions. First, this documentation of the experiences of faculty and administrators at institutions in the process of introducing digital resources in the classroom will likely provide insights for decision-making in the implementation of technology to any degree. This exploration of the experiences of faculty regarding technology training for pedagogical applications may assist in identifying both barriers and opportunities for faculty who may not initially be at ease
with the technical requirements, or who are not confident resources exist for them to obtain assistance on short notice when there is a problem. A study of this kind can also provide valuable information to faculty and administrators considering the applicability of digital tools – in the areas of hardware, software and pedagogical approaches alike – to guide them in making choices regarding technology investments that will enhance the classroom experience for instructors and for students.

**Deficiencies in the Evidence**

As already indicated, there is an apparent disconnect between the traditional pedagogy associated with a liberal arts education and the opportunities for technology to enhance instruction for the digital native seeking a liberal arts degree. Businesses do not have this reticence. Forbes Magazine innovation columnist George Anders (2017), writing about the emergence of liberal arts graduates in the technology-based world in the San Francisco Bay Area, reported that Stewart Butterfield, the founder of Slack, touted as “one of the most glistening of tech's ten-digit ‘unicorn’ startups,” has undergraduate and graduate degrees in philosophy (p. 1). Interviewed in that article, Butterfield credited his liberal arts education with helping him to learn to think clearly, and to “follow an argument all the way down,” which Butterfield said was invaluable in running meetings (Anders, 2017, p. 2). Anders also highlighted Rachel Lee, a University of California-Berkley graduate, with a degree in communications, employed by Slack. Lee does not write code, and is not part of the technical processes at her company; however, in the brief time Lee has been part of the operation, she has already impressed her colleagues with her lucrative savvy and agility to “connect with end users to find out what they want” (p. 4). These individuals attributed their success directly to their liberal arts degrees.
With value of the liberal arts confirmed, what still remains lacking is research on faculty experiences with the use of digital tools in higher education, in particular within the liberal arts classroom. Garner and Bonds-Raacke’s (2013, p. 146) review of technology integration in higher education classes placed the onus for lack of technological capacity on faculty who are not current in yet unrealized opportunities of digital education programs. The most traditional-bound professor can demonstrate Greek philosophers in a response-driven virtual question and answer program online, but they must have the tools and training to do so. Science instructors who already use multi-media tools can invite well-known researchers and writers to talk to their students via Skype or other video messaging programs. The major limitations in implementing these changes are the cost of upgraded technology and the hesitant desire by the faculty to use that technology as part of their curriculum. Training is also a major consideration. This dissertation explores both.

**Relating the Discussion to Audiences**

The primary audience for this paper will be the faculty members, administration, and students at Midwest College (a pseudonym), as well as a wider audience of institutions facing similar challenges. The information gleaned from this study can be used to enhance instruction at this college and to provide insights into how to best support students and teachers at this school and other similar institutions with the use of pedagogical technology. Further, the analysis of the comments elicited from respondents and document analysis, and likely later from offering workshops and follow up discussions on campus, has the potential to assist college leaders and faculty in the development of a digital education training program to allow faculty and students to implement programs to apply technology effectively and cohesively in the classroom, in collaboration across disciplines. Keengwe, Kidd, and Kyei-Blankson (2009) noted that faculty
may be at a disadvantage if they are not given instruction and guidance in effectively integrating their curricula into a technological setting; the authors point to the mantra tied to technology: “familiarity does not equal proficiency.” (p. 24)

The findings of this research may also be useful for other liberal arts colleges in other contexts and could contribute to contemporary conversations regarding the value of digital tools for delivering a liberal arts education. It aimed to add to an understanding of how the a framework like TPACK – explained in detail below – can be used to support student success.

At the time this study was conducted, the TPACK approach to technology implementation was not being utilized formally at the institution that served as the site for this study. The intent of the study was to interview a small group of faculty members across disciplines, technology experts, and administrators to ascertain the process of the introduction and implementation of such digital education products, and their usefulness in the context of the college’s liberal arts tradition. As cited previously, faculty, administration, and students at the college were grappling with the implications of the introduction and inclusion of digital education tools, and the effect these tools have on the traditions of liberal arts lecture and discussion formats. In this sense, this study sought to shed light on any academic gulf between the technologically adept faculty and those who were using few if any of these tools in their instruction. The process in part aimed to gauge the possibility of creating collaborative relationships for building technology capacity, similar to K-12 settings. The feedback was intended to create a point of discussion on campus going beyond simply distributing iPads or other digital devices, and to motivate a discussion of the overall worth of launching initiatives involving digital education programs campus wide. Institutions such as Midwest College have decisions to make regarding retrofitting or completely overhauling their technology systems to
meet student expectations and “marketplace” demands, as well as faculty capabilities, to create access to and workability for this form of education.

Research Questions

The central research question for this study was: What are the experiences of faculty and administrators at a liberal arts college in the Midwestern region of the United States that hosts a variety of undergraduate majors as they negotiate the integration of technology/digital learning into traditional pedagogy, educational practices, and institutional structures?

Subquestion 1. What are the components of the history, culture, and institutional practices of a traditional liberal arts institution that either impede or facilitate the integration of technology into classroom teaching?

Subquestion 2. How do faculty members describe the level of technological competence they have to integrate new digital-based teaching methods into the classroom?

Subquestion 3. What are the challenges instructors and administrators face regarding the integration of technology into the liberal arts classroom setting?

Subquestion 4. What kind of resources, training, and institutional changes would be required to support faculty members in advancing digital-based teaching in their classes?

Positionality Statement

As a faculty member at a liberal arts college, there is a possibility of bias, including implicit bias, because the researcher’s familiarity with this type of institution and its faculty members and administrators. Ponterotto (2005), using an example of interviews with migrant workers, commented that interpretivists “bracket” their biases (132). I perceive that my personal and professional history and relationship with peers and administrators working in a liberal arts setting can actually serve as an asset in the data collection process. I am an “insider” of an
institution of this type and understand the day-to-day operation of this type of college; I can thus harmonize this personal and professional knowledge and experience towards engaging in meaningful dialogue with college staff and faculty. I will, however, be committed to remaining open-minded, not prejudging circumstances – in short, I will enter the process with curiosity, willing to be surprised by the findings.

At the college that is the focus of this case study, exploratory contact with faculty and administrators revealed that there was not an open aversion to technology, per se, when this study began. The objections appeared to be tied to a philosophy that traditional liberal arts ought to continue in the model of lecture-discussion-test; however, to some extent, faculty were being encouraged at the time to introduce multi-media programs and digital education technology in their own classrooms.

Theoretical Framework

![TPACK model](image)

*Figure 2. TPACK model. From (Koehler, 2012) Reproduced by permission of the publisher.*

The Technological Pedagogical Content Knowledge (TPACK) framework was chosen to help guide this study. This section will describe the framework including the philosophical
foundations and seminal authors, discuss the rationale for choosing this theory, and explain the 
alignment of the TPACK framework to the research question and case study design.

TPACK attempts to identify the nature of knowledge required by teachers working to 
integrate technology into their teaching, and also addresses the complex, multifaceted and 
that implementing technology requires teachers to reflect on and question their core 
epistemological and pedagogical beliefs; otherwise, the technology will be implemented in 
procedurally meaningless ways according to prevailing teaching practice (p. 234). The authors 
noted that TPACK can be an effective framework to examine how teachers’ knowledge is 
constructed, based on reflections on the teachers’ ritual of listening to other teachers about their 
experience with technology and its impact on classroom content. This study accepted from the 
start that the real-life experiences of teachers are different that the collection of “desirable 
knowledge” they are expected to acquire to be efficient (p. 235).

The diagram above depicts the TPACK framework, which includes the complex interplay 
of three primary forms of knowledge: Content Knowledge (CK), Pedagogical knowledge (PK), 
and Technological Knowledge (TK). Rosenberg and Koehler (2015) examined research 
advancing the concept that TPACK indeed represents a transformative body of knowledge that is 
enacted when teachers consider and integrate technology, pedagogy, and content interactively in 
their teaching. Moreover, the transformative perspective considers learners and context to be 
integral to teachers’ ability to integrate technology into their classrooms. (p. 188). The role of 
TPACK in bolstering content and pedagogical knowledge with emerging technology in K-12 
settings is strongly documented, dating back to the late 1900s. TPACK implementation in higher 
education settings was just beginning to be documented when this study was conducted,
including the issue of student versus instructor interest in using technology in a liberal arts classroom, as well as the viability of digital education tools in a strictly lecture/discussion setting. Koehler and Mishra (2009) stated that introducing TPACK, or other similar approaches, requires a process that integrates what teachers “know” and how that knowledge can be introduced with assistance of technology in their unique classroom situations (p. 62). Buzzard et al. (2011) pointed to a Cengage survey conducted in 2009 showing students outpacing their instructors in asking for technology and software as part of their learning regimen (p. 135). Demonstrating TPACK’s role in the overall presentation of content and knowledge may reduce the ranks of faculty who doubt the place for interactive digital programs and other technological tools. The following section outlines the three major components of the framework as it relates to its application in a liberal arts setting.

**Content knowledge (CK).** The CK component of TPACK is a building block for what Deng (2007) called the “transformation of subject matter” which the author states involves transforming what a teacher possesses when they enter in a classroom (p. 280). McCaughtry (2004) expanded on the transformation process to include the concept of emotional understanding as a component in content knowledge. McCaughtry (2004) observed that, when knowledge of student learning mixes with disciplinary knowledge, the process, among other attributes, helps teachers present more accurate content, and students can see connections across curricula (p. 33) Applying the element of content knowledge allows benefits, including students making the larger connections through the presentation of class material. This element of TPACK, as was being applied in middle school and high school settings at the time of this study, can be presented through current delivery settings, at the university level; but the content might vary (Koehler, 2012).
At issue is the method and tools teachers will acquire to convey content, through whatever technology is available. Benchmarks that indicate when teachers attain technical knowledge that equips them to effectively present the content, perhaps through peer coaching, are necessary. Koehler and Mishra (2009) stated that, for TPACK to be effective, there may be an instructional method in chemistry that is much different than a podcasting or video training course (p. 1030). Instructors may be overwhelmed by technology or how best to apply pedagogy in what may be a class that is heavy on peer participation.

Rosenberg and Koehler (2015) confirmed this dialectic. They discussed the importance of the integration of teachers’ and students’ combined processes as teachers apply TPACK as “actors” and align to build within their frameworks an interactive knowledge base using the approach (p. 188). Mishra and Koehler (2006) observed that it is not enough to simply introduce technology into a classroom. There is the need to move beyond attempting to determine what teachers need to know to properly assisting them in utilizing the technology and in presenting content to their students (p. 1038). Given the variations in technology and pedagogy which may be utilized within different frameworks, integration is a formidable task for students, teachers and administrators.

**Pedagogical knowledge (PK).** Hudson (2004), in reviewing literature on pedagogical knowledge, noted that the underpinnings associated with PK include acquisition of knowledge and mastery of the topic, application of practical knowledge, and development of mentors to assist those who have practical skills to become more adept in their pedagogical areas (p. 215). It is impractical for a teacher to simply launch a course without some grounding, becoming familiar with instructional practices, and with learning expectations (p. 216). This knowledge sharing is a main component of PK:
Teachers’ deep knowledge about the processes and practices or methods of teaching and learning… encompass, among other things, overall educational purposes, values, and aims. This generic form of knowledge applies to understanding how students learn, general classroom management skills, lesson planning, and student assessment. (Koehler & Mishra, 2009, p.64).

Thus, teachers give the guidance in presenting pedagogical knowledge, yet the intent in the class setting is to have the student take the content and develop their unique research path. Savery (2015) examined problem-based learning (PBL), an outgrowth of medical school programs that include the lecture/discussion component of a liberal arts setting, but, given the explosion of health information and advances in science, also have moved into the concept of student responsibility for researching specific health issues, gathering data, and presenting findings, with the assistance of a tutor, when needed. Research from studies in the 1980s and 1990s showed students trained in PBL exhibited better problem solving skills, and another study showed students reported being more engaged in learning specific content (p. 6). Savery (2015) listed the essential goals and described them on the PBL website:

Students must have the responsibility for their own learning, the problem simulations used in problem-based learning must be ill-structured and allow for free inquiry, learning should be integrated from a wide range of disciplines or subjects, collaboration is essential, what students learn during their self-directed learning must be applied back to the problem with reanalysis and resolution, the activities carryout in problem-based learning must be those valued in the real world (p. 8).

Technology properly taught, used, and applied through an integrated approach can fully assist this process.
**Technology knowledge (TK).** This component of the TPACK framework includes the assertion that having a working knowledge of how technology, hardware, and resources interconnect allows instructors to apply that knowledge across different areas of coursework. This includes an understanding of information technology broad enough to apply it productively at work and in everyday life, with the capacity to recognize when information technology can assist or impede the achievement of a goal, and the ability to continually adapt to changes in information technology (Koehler & Mishra, 2009). Prensky (2001) pointed to research demonstrating that students, who are, as a group are “digital natives,” have brains that constantly reorganize physically and cognitively throughout their lives (as do adults’ brains). This phenomenon is known as neuroplasticity. Additionally, the author referenced studies showing that “cognitive processes themselves are just far more malleable than mainstream psychology assumed” (p. 3). Prensky (2001) added that digital natives are different than digital immigrants, in they are used to receiving and processing information quickly, they enjoy multi-taking and parallel processing, and they function best when networked (p. 2). The limited capacity of digital immigrants to adroitly perform classroom delivery is an irritant to natives, who demand immediate information and access.

**Pedagogical content knowledge (PCK).** Hudson (2004) identified PCK as understanding content, creating strategies for teaching the material, and implementing content effectively enough to allow the learner to learn (p. 215). PCK embraces these points, and advances them to be consistent with and similar to Shulman’s (1986) idea of knowledge of pedagogy that is applicable to the teaching of specific content. Central to Shulman’s (1986) conceptualization of PCK is the notion of the transformation of the subject matter for teaching. Specifically, according to Shulman (1986), this transformation occurs as the teacher interprets
the subject matter, finds multiple ways to represent it, and adapts and tailors the instructional materials to alternative conceptions and students’ prior knowledge. PCK covers the core business of teaching, learning, curriculum assessment, and reporting, such as the conditions that promote learning and the links among curriculum, assessment, and pedagogy (Koehler & Mishra, 2009, p. 64).

Rosenberg and Koehler (2015) discussed research into the TPACK framework, particularly examining whether or not the framework rests on the premise that the overlapping components are integrative, and that the areas of knowledge are distinct or transformative, wherein the area of knowledge in the framework they are indistinguishable and holistic. The authors further noted there is a refining of focus, to compensate for the evolving belief that more components are needed to reflect the complexity of technology integration in the classroom and the complex role of contexts (p. 188). While technology is a growing component in learning, the framework also looks deeper at what constitutes instructional approaches, traditional or technological, as a tool to develop critical thinking.

**Description of the framework.** TPACK provides a framework for guiding effectively designed and constructed technology-enhanced instruction (Lin, Tsai, Chai, & Lee, 2012). Mishra and Koehler (2006) noted that the approach’s predecessor, pedagogical content knowledge, or PCK …exists at the intersection of content and pedagogy. Thus, it goes beyond a simple consideration of content and pedagogy in isolation from one another. PCK represents the blending of content and pedagogy into an understanding of how particular aspects of subject matter are organized, adapted, and represented for instruction. (p. 1021)
The authors credited researcher Shulman (1986) for developing the theory of PCK, citing him positing that content and knowledge were prior treated as separate entities, but they should be considered in tandem, leading to PCK (Mishra & Koehler, 2006). The authors also credited Shulman (1986) with creating, at least indirectly, the marriage of technical, pedagogical, and content knowledge, though insufficient evidence exists to confirm that Shulman (1986) directly tied technology with pedagogical and content knowledge.

**Rationale for choosing the TPACK framework.** Although different theories emerged as possibilities for framing this study, the TPACK framework was chosen with the intent of exploring complimentary and potentially conflicting issues, which emerge as liberal arts institutions consider options in introducing digital education technology, software, and pedagogical and other applications. Seifert et al. (2008) observed the apparent cross-purpose arguments concern, on one hand, the strict interpretation of the value of a liberal arts education, and on the other, arguments for a “practical” learning program that is in part based on the incorporation of technology (p. 108).

Several studies have used the TPACK framework to explore the effective incorporation of technology into the classroom. Mishra and Koehler (2006) identified a shortcoming of a strictly technological approach, however: “Although technology constrains the kinds of representations possible, newer technologies often afford newer and more varied representations and greater flexibility in navigating across these representations (p. 1028).” The authors stated that teachers must know not only the subject matter they teach but how that subject matter can be changed as technology is introduced.

**Alignment of the TPACK framework to the study.** The TPACK framework informs the research question for this study. Responses by faculty members, technology staff, and
administration to the development of educational technology tools and their impact on a traditional liberal arts program presented the opportunity for developing a descriptive case study to examine the question: What are the experiences of faculty and administrators at a liberal arts college in the Midwestern region of the United States that hosts a variety of undergraduate majors as they negotiate the integration of technology/digital learning into traditional pedagogy, educational practices, and institutional structures? Faculty, staff, and administrators were thus interviewed for this study to share their experiences in retaining a strong liberal arts approach to pedagogy as the availability and viability – and even sometimes the mandate – of the integration of digital education tools was becoming more prevalent.

The TPACK framework helped guide the development of the interview protocols used in this descriptive case study. Creswell (2013), in discussing qualitative research protocols, described how researchers arrive at their central question and sub-questions. The initial question may be broad-based, addressing the research problem, and sub-questions in anticipation of a range of responses (p.139). Question topics for this study sought to obtain respondents’ perspectives regarding, first, the value and viability of a liberal arts degree in the 21st Century; next, the applicability of liberal arts classroom experience in a “real world” workplace setting; finally, visions on how best to integrate pedagogical, content, and technical knowledge into traditional classroom curriculum and teaching practices.

Morsink et al (2010) outlined the significance of engaging teachers in approaches like TPACK, the findings of which directly served as a guide in forming questions for this study: The researcher queried faculty, staff, and administrator viewpoints on whether or not, why, and the extent to which traditional liberal arts lecture/discussion/test approaches were in many ways becoming inadequate; he also explored in what ways those interviewed perceived an openness to
the concept that technology and digital education tools might improve the acquisition of content and critical thinking skills for today’s liberal arts student. He probed whether or not and the extent to which opportunities existed for faculty to make an actionable commitment to innovate and improve teaching, using education technology, and what factors shaped these opportunities or restrictions. Morsink et al. (2010) stated that faculty and administration can opportunely retain the best practices of traditional liberal arts, while seeking advice on the most effective digital education products and most efficient technology to deliver those products in a way that prepares students for a myriad of complex and intersecting employment and career demands (p. 5).

In their study of the attitudes of instructors in a secondary education setting who are inculcated into the implementation of technology as an enhancement to learning, Morsink et al. (2010) noted that success as defined for many colleagues lay in the teachers’ “comfort level” with technology outside the classroom and their attitudes about their technological skills, aside from instructional use (p. 14). It may be inferred that, using general definitions of TPACK as identifying the nature of knowledge required by teachers for technology integration in their teaching, educators may judge their ability to utilize digital education tools based on their positive or negative experience in utilizing “everyday technology.” Recognizing that TPACK and other similar frameworks by definition integrate content knowledge, technical knowledge, and pedagogical knowledge, it may be inferred, that educators may be well-versed in their body of knowledge that they teach, but may face personal and professional challenges when faced with advancing technology that is being integrated in a learning system. Those hesitancies and barriers were directly explored in this study.

Meanwhile, Morsink et al. (2010) cautioned sharply against the “crash course” introduction of technology, and advocated that the preferred methodology is a long-term
integrated introduction of technological tools and skills, allowing users to identify and build on those acquired skills, and integrating this knowledge base in their specialized areas of instruction (p. 3). The authors discussed the continuing effort by teacher educators to create measurements to determine the competence of their students in adapting emerging technologies, and integrating them into their educational and professional practices (p. 235).

Emerging literature has supported TPACK and its technology outgrowth of PCK, particularly in reference to the professional understanding of how to organize and present specific topics, problems, or issues for instruction according to student background, school educational goals, and educational context (Juang, Liu, Chang, 2008, p. 149). As Juan et al. (2008) observed, content knowledge is attained through continuous training and subject immersion, with technology as a tool for this process. This acquisition of knowledge may be spread across a variety of college disciplines, a major aspect of PCK.

Addressing the overall application of TPACK and similar approaches in learning and teaching at the college level, Matas (2014) observed that technology has become pervasive in all aspects of daily life, with free, unfiltered information a click away (p. 10). Matas’ conclusions mirrored other researchers in that he identified the need to continue investigating how technology integration affects teachers’ knowledge and skills, content in the classroom, student learning, and the overall relationship between student and teacher (p. 119).

While the percentage of literature addressing technology impact on colleges appears to be less than those addressing the technology gaps in K-12 systems, emerging literature has supported even if on an ancillary basis further research using the TPACK theoretical framework and other similar orientations at the college and university level. However, the literature in question (Balkun, 2011; Maeng et al., 2013; Morsink, et al, 2011) has been driven more by a
focus on technological impact on learning, as opposed to the integration of complex pedagogy (Lin, et al., 2011; Saaverda and Opfer, 2012). Researchers who identify with the technological impact appear more directed to examining the capacities and function of infrastructure and the connected hardware, isolating the technological in TPACK; significant room remains for more comprehensive studies incorporating the learning prism of how the technologically uncertain are convinced to try new methods and are trained, and how they pass their acquired knowledge to colleagues, so that technical expertise is shared and may be measured through positive student and faculty peer outcomes. This study explored faculty perceptions and administrators views of this process.

Morsink et al. (2011) presented the argument that faculty adoption of an approach like TPACK can succeed when faculty members:

- Are open to the possibilities of content and procedures which worked in the past may be improved with the implementation of new technologies.
- Have an ongoing professional reflection and commitment to identify areas for innovation and improvement.
- Remain aware that new technologies have positives and negatives.
- Are willing to be involved in continuing to learn more about technology tools and options, and to access the technology expertise and advice of peers and others. (p. 4)

These considerations were comprehensively explored through this descriptive case study.

Limitations

Criticism of TPACK is limited. In a blog post, educator Richard Olsen (2012), having attended a series of TPACK seminars, offered the critique that TPACK is not viable, and is not an innovation, based on several points. Olsen (2012) contended that no difference exists between
CK and TCK, and that no reason stands for technology to be included as a “primary form of knowledge.” He also claimed that “…while Shulman’s original Pedagogical Content Knowledge model may have some use for understanding what teachers need to know about teaching and learning, the TPACK model does not [have this potential]” (p. 1). In a response to the posting, author Mishra (2012) responded that TPACK indeed presents different elements to different observers and does hold up comprehensively even if the focus on what is primary varies:

To content area teachers, it allows them to see the value of technologies in representing and engaging with content; to teacher trainers it allows them to think about the significance of content and technology; and to techie types, it shows that there is more to teaching than the tool – it has to do with pedagogy and content. (p. 1)

The concern about TPACK, and the limitations of investigating any concern, is the lack of literature specifically aimed at devolving the theory. This researcher contended that it remained comprehensive and robust enough to serve as a framework of analysis for this study of a Midwest liberal arts college’s process of implementing pedagogical technological approaches into traditional disciplinary curricula and practices.
Chapter 2: Literature Review

Introduction

As liberal arts students emphasize their need to maintain and hone digital proficiency for employment success, in combination with the traditional and much valued critical thinking and problem solving skills liberal arts offer, it becomes crucial to understand the challenges and opportunities faculty, administrators, and staff face, particularly at small institutions, as they integrate new technologies into pedagogical practices. As Alexander and Davis (2012) observed:

Interdisciplinarity presents its usual challenges: difficulty in winning champions and resources in a discipline-structured environment. Similarly, the cross-population nature of digital humanities work, which requires faculty members, librarians, and technologists, makes it hard to garner interest in digital humanities projects. The combination of newness, technology change, and inclusion of multiple sectors and disciplines make (re)defining the digital humanities both problematic and necessary. (p. 372)

While scholars have categorized and examined a variety of experiences regarding increased use of multi-media and the ways it has been implemented technologically and pedagogically in the classroom, mostly this research has been conducted at larger institutions of higher education, or at smaller urban colleges. Not much is known about this process at small liberal arts colleges in rural areas.

The purpose of this descriptive case study was to explore the experiences of liberal arts faculty members at a private, Midwest College as they incorporated digital tools into their teaching and to document how faculty, administrators, and staff made sense of how to use digital tools to impact student and institutional success. The results of this study have the potential to provide insights for small liberal arts colleges nationwide regarding the current debates
surrounding the integration of technology and pedagogical applications, particularly by exploring blended learning, and informed by the framework of Technological, Pedagogical and Content Knowledge (TPACK).

This literature review is organized as follows. First, it traces the origins, history, values and pedagogical practices of the tradition of liberal arts education from classical antiquity to the present; these practices have created and maintained a form of learning focused on “skills of communication, critical thinking, reasoning, and research” which, as Chapter 1 outlined, are highly valued by today’s employers (Delluchi, 1997, p. 423). It then examines one approach – blended learning – which has proven effective in assisting faculty in broadening their traditional liberal arts pedagogical techniques to include a variety of technological practices and innovations. Finally, the chapter analyzes the skill set faculty members need to bring digital technology pedagogies into the classroom – and the challenges they face in doing so -- with examples of successful and concrete initiatives from other institutions that have met the goals of blended learning.

**History of Liberal Arts Colleges**

The tradition of a liberal arts education in the United States stretches back to the earliest days of higher education in this country. Lang (1999) described the classical model of the liberal arts philosophy:

> While imparting knowledge, their academic regimen was also intended to develop personal character and intellect to turn out what continues to be confusingly styled "the whole person," prepared to function knowledgeably within a framework of civic responsibility. (p.134)
In his discussion of the elements and foundations of a historically liberal arts education, McWilliams (1999) explored the basic goals of liberal arts and “free men” and outlined two perspectives for the education of free individuals: As McWilliams (1999) asserted, “the oratorical, emphasized the arts of grammar and rhetoric and the ability to prepare and present a persuasive speech in the context of participatory democracy This approach supports the legitimization of the traditional virtues and order of the society.” The second approach, as McWilliams described was a “rational path of logic and mathematics as the disciplines by which we might further human understanding and transform it through analytical and critical thought” (p. 261).

The Midwest College, which is the focus of this study, has a 160-year tradition of providing a liberal arts education. It was founded in the mid-1800s and began classical liberal arts coursework with the first class of six students. Nearly 50 years later, the Midwest College was accredited as a degree-granting liberal arts institution. The structure of the college has its roots in the classical tradition, which Pfnister (1984) quotes Cobban and “The Medieval University” (1975):

In the fourth century, Flavius Cassiodorus established the principle that students of theology should have preparation in the liberal arts, but when the universities emerged in the twelfth century it was assumed that those entering the "higher" studies would secure their own training in the arts, and no special provisions were made for the beginning students. The first colleges were simply boarding houses for poor students [pp. 123-26]. It was later that these colleges developed as residential and instructional entities, designed to prepare younger students in the arts for admission into the advanced faculties
that constituted the university proper. Still later, the arts colleges became the basic units of the university structures in France, Germany, and England (p. 147).

It is one thing to identify the rich history of a classical liberal arts institution, but is there a method or series of statements that reduce millennia of tradition into simple declarations of the purpose of a liberal arts institution? Delluchi (1997) quoted a 1993 section of Petersen’s *Guide to Four Year Colleges*:

> [This university] affirms the enduring value of liberal learning – the 2,500-year tradition dedicated to developing the whole person and to forming habits of reflective thought that last a lifetime (p. 1110). The liberal arts curriculum exposes students to the major branches of study and builds their skills of communication, critical thinking, reasoning, and research (p. 1382). [At the college] students receive a liberal arts education that challenges them to excel in the humanities, the sciences, and the arts; cultivates social values; and inspires lifetime goals. (p. 415)

Liberal arts institutions, including the college which is the subject of this thesis, have, in common, a history of a philosophical or theological-based learning structure, combined with a direction to develop scholars who are able to address the needs of the world at large and as problem solvers. Citing Pascarella et al. (2005), Seifert et al. (2007) pointed out that

…attending a liberal arts college, compared to a research university or regional institution, yielded mixed effects on student learning outcomes (i.e., positive effects on openness to diversity/challenge and learning for its own sake but negative effects on mathematics and science reasoning). Controlling for a host of demographic, precollege, and college characteristics, including a pretest on every outcome, attending a liberal arts college promoted the development of some outcomes, inhibited the development of
others, and largely had no significant effect on the development of many of the learning outcomes under examination. (p. 109)

There are students who may have a general understanding of the expectation of a liberal arts education, but from where does this information originate? Wentzel and Wigfield (1998) observed that it is “important to consider differences between individuals' subjective task values and their achievement goal orientations, because both constructs deal with the purposes individuals have for doing different activities” (p. 159). The authors asserted “the major distinction is the level of specificity of the constructs. Subjective task values refer more to purposes for doing different tasks, and so they are quite specific and therefore may change greatly as individuals encounter different tasks” (p. 159). The authors examined the complexity of the liberal arts model and identified areas for future research, concluding that scholars “need to explore further how different classroom and interpersonal contexts influence students' academic and social motivation…these contexts can impede as well as facilitate motivation” (p. 170). Wentzel and Wigfield (1998) identified “[t]he complex but important interplay of students' motivation in different social settings and contexts clearly deserves closer attention” (p. 170), which was also a motivation for this study.

Thus, challenges and opportunities exist as liberal arts colleges struggle to maintain the strengths of their historical structures and traditions while also grappling with the implementation of rapidly changing technology and associated interactive pedagogies. In his chapter on the creation of the Chautauqua vision of liberal education, Scott (2005) reviewed the growing interest in liberal arts in the mid-19th Century, under the umbrella of “self-improvement” and declared:
The general public, too, sought liberal knowledge. Quoting Malcolm Knowles, 'the basic spirit of the "American dream"—the notion that every person can get ahead if he is willing and works hard—which has so greatly influenced the growth of adult education' began during the colonial period. Self-taught Benjamin Franklin both stimulated and became the prime example of this American popular compulsion to improve oneself, which extends forward to the community college of today. (p. 43)

In short, the history of liberal arts education appears to have a pull for and against a “pure” learning model, that is, “learning for learning’s sake,” and the development and execution of programs which prepare students for a fast paced and highly technological life outside the institution. Seifert et al (2008) stated, however, that this supposed gulf can be addressed:

The liberal arts emphasis and experience scales attempt to measure the practices and conditions that contribute to a seamless institutional ethos, which values student-student and student-faculty interaction within a supportive environment characterized by high expectations for developing a set of intellectual arts and habits of mind more than professional or vocational skills (p. 110).

The traditional liberal arts instruction model, at the time this study was conducted, remained a linchpin for success at the small private college on which this dissertation focused; this is not uncommon at other similar, semi-rural colleges across the country. The lecture/discussion/assignment model was in place across the disciplines at this Midwestern college, and the critical thinking skills this approach garners had been listed by students as a reason they chose to attend a small liberal arts institution.

**Summary.** At the institution that was the focus of this study, faculty had historically been dedicated to the Socratic instructional method, with an emphasis on “self-knowledge,” “self-
expression,” and/or “learning for learning’s sake.” Advocates of this approach in general have listed its advantages: coursework that is not “vocation-specific” and the ability for instructors and students to work closely together compared to a larger institutional setting. This section has outlined the history and context in general of the liberal arts tradition, and has introduced the complexity of introducing digital technology into classroom pedagogies, as well as the context in which the introduction of digital technology occurs. As this section has documented, the conflicts and challenges surrounding incorporating digital technology into traditional liberal arts instruction go beyond installing adequate tools to present the material. The challenge is faculty motivation to utilize the tools, and training in pedagogy that will allow instructors to effectively apply them. As asserted in Chapter 1, the blended learning approach, which is the focus of the next section, thus merits examination.

**Blended Learning**

As briefly outlined in Chapter 1, scholars have documented an approach --blended learning – that has proven effective in integrating traditional pedagogical instruction via digital and online media. As previously noted, blended learning effectively connects a lecture and discussion-driven teaching style, a hallmark of liberal arts, with dynamic digital technology pedagogical approaches. This combination responds effectively to market demands for professionals who comprehensively exhibit both creative, critical thinking skills and proficiency in applied technology.

Some major initiatives of blended learning have been documented. Oakleaf and Van Scoy (2009) referenced social constructivism as one instructional method that lends itself to effective learning, whether through the lecture mode, or online (p. 381); within this parameter, applications of blended technology strategies have been documented. As Gold (2012) noted, the
City University of New York (CUNY) incorporated digital humanities at the core of their “Writing Across the Curriculum” programs (p. 175). With the advent of “open admissions,” that is, allowing any high school recipient of a diploma to gain admission to CUNY’s senior and community college system, remedial math and writing programs had to be created to assist incoming students whose public schools had not prepared them for college level writing. The Search for Education, Elevation, and Knowledge (SEEK) program emerged from this identified need to address it through blended learning; it continues today, though open admissions ended in 1999 (p. 393). Gold (2012) also highlighted a four-campus online collaborative, “Looking for Whitman”, which combined digital research and digital pedagogy in exploring the work of Walt Whitman (p. 163). In addition to video conference collaboration, students produced multimedia projects highlighting Whitman’s life and work, digitized in an archive and presented through an online site. These basic tools allowed instructors and students to share their research with colleagues nearly anywhere, using tools as simple as Skype or Google Hangout. These programs are replicated across the country, and not only at larger institutions.

Other similar initiatives that incorporate blended learning include: the American Social Media Project; the Interactive Technology and Pedagogy Doctoral Certificate Program; the Instructional Technology Fellow Program; the CUNY Academic Commons; and the Digital Humanities Program. Gold (2012) stated that these programs bridge the gap between digital technology and digital pedagogy, and the author engaged CUNY faculty and students in a conversation about how best to improve instruction using both technology and bolstering the relevancy of the liberal arts (p. 398). How and if these types of initiatives may be implemented with the assistance of digital education programs and tools in liberal arts settings deserves even further examination. Garrison and Kanuka (2004) who described the blended learning model:
(They) believe hybrid or blended learning has transformative potential for higher education...they posit that hybrid or blended learning is an effective and low-risk strategy which positions universities for the onslaught of technical developments that will be forthcoming in the next few years (p. 96).

Georgina and Olson (2008) indicated that the introduction of blended learning may require a re-evaluation and reorganization of pedagogical strategies. Their study, however, was primarily concerned about the level of technological training available – or not – to faculty and staff rather than the actual pedagogical implications and the percentage of learning and instruction, which may take place in a technologically heavy setting (p. 7). So and Bonk (2010) conducted one of few existing studies of students and faculty members at a four-year liberal arts institution attempting to determine the efficacy of face-to-face and online learning models, using tracking software. As the authors described:

Program-level blends tend to be more administratively than pedagogically driven. It is further suggested that blended learning environments vary widely according to the following goals: pedagogical richness, access to knowledge, social interaction, personal agency, cost effectiveness, and ease of revision (p. 190).

The authors arranged a panel query of nearly three dozen academics who had concentrated on blended learning to be part of those surveyed. Their survey included questions concerning the effectiveness of blended learning in facilitating collaborative activities, and what challenges interfered with collaboration. The survey also addressed collaboration among students in blended learning classes, and whether panelists believed collaboration in a blended learning setting could extend regionally, and to other institutions of higher learning. Their goal was to ask: How might students and instructors better collaborate in a blended learning setting? They queried whether or
not experts, faculty, and students could better collaborate and share in blended learning environments and how might online collaboration evolve over the next couple of decades (p. 192). Concluding, the authors stated: “[B]lended learning offers unique opportunities for international collaboration, knowledge construction and negotiation, and project management. At the same time, the resources available to students for such interactions and collaborations widen the spectrum of learning” (p. 197).

Wang, Hon, and Yang (2014), meanwhile, examined blended learning and its impact on pedagogy with the growth of online coursework, massive open online courses (MOOCs), and “flipped” classrooms, where students read through online coursework after hours, and come to class prepared for exercises tied to those readings (p. 380). They noted that there is not a common identification or definition for “blended learning,” “hybrid learning,” or variations of those concepts. An additional issue is the validity and credibility of anonymity of online writing in blended learning and other formats. Miyzoe and Anderson (2011) discussed their research in studying peer review in online learning, determining that writers who choose to use a pseudonym or otherwise remain anonymous tend to perform better in online writing programs (p. 176). Further, discussing implications, the authors stated:

In a blended course design environment, this study found that student participation in face-to-face attendance and online activities were similar. The students also perceived that both forum and blog writings were useful in improving their writing skills and strengthening their ability to comprehend forums and reflect on blogs. The opportunity to use pseudonyms was also highly appreciated. This means that using pseudonyms can be a useful strategy to induce higher participation in online writing (p.183).
Delialioğlu (2012), meanwhile, conducted research involving participants in a third-year blended learning computer networking course, part of a pre-service teacher education program. His survey included three engagement periods, measuring student interest in problem-based instruction, and he posed three questions to students and faculty:

- Are there significant differences in the indicators of student engagement measured as Active Learning, Student Interaction, Level of Academic Challenge, and Time on Task between a lecture-based blended learning environment and a problem-based blended learning environment?
- Is there a significant difference in students’ course satisfaction between a lecture-based blended learning environment and a problem-based blended learning environment?
- Do students’ individual differences (student demographics attributes, student motivation and ability attributes) impact student engagement in a lecture-based blended learning environment and a problem-based blended learning environment? (p. 312).

Students reported they spent more academic time with problem-based learning versus lecture-based learning programs, yet students said they were satisfied with both instructional models (Delialioğlu, p. 320). About 90 education-major students participated in a course which utilized traditional and blended learning models. The students were surveyed at three points in the semester to measure student motivation and engagement, dependent on the format they were using, traditional learning or blended learning. Notably, this was a mandatory course, but participation in the survey aspect was voluntary (p. 312). Delialioğlu (2012) through the survey found:

Students reported significantly higher use of active learning strategies during the problem-based blended learning part of the course in comparison to the lecture-based
blended learning part of the course. Problem-based learning increased student engagement in blended learning environments similar to traditional learning environments. Another significant finding was the difference between the total time spent on academic activities during the lecture-based and problem-based parts of the blended course. Students reported significantly higher time spent during the problem-based blended learning part of the course. In comparison to the traditional lecture-based methods of instruction, problem-based learning activities required students to actively engage in the learning process (p. 318).

Thus, the author through the study, and citing experts who had previously explored blended learning (Hmelo-Silver & Azevedo, 2006) saw a middle-ground in presenting the traditional, problem-based learning style, and blended learning, concluding: “The use of blended learning environment has the potential to help close this difference between the problem-based and the lecture-based courses” (p. 320).

An issue that does not present itself to great degree in a discussion of traditional versus non-traditional learning models is the issue of confidentiality/anonymity. Do students prefer keeping their identity secret as they progress in their coursework? This is an important question for the application of blended learning. Miyazoe and Anderson (2011) examined use of pseudonyms in online discussion and submission sites and students’ comfort levels when using peer review in their online writing and other class work. On the positive side, students were slated to feel more comfortable directly critiquing another’s work if they were not aware of that other person. Negatively, the anonymous reviewer could potentially present insulting and personal “flaming” comments, stultifying acceptance of any feedback, with the possibility the student’s potential might be reduced (p. 176).
Summary. This section has documented the concept of blended learning, one approach used to assist educators in incorporating digital pedagogical techniques into the classroom. This aspect of the literature review examined the ways in which practitioners in the liberal arts setting can move out of their so-called Socratic “comfort zone” of the traditional liberal arts lecture/discussion/assignment format to incorporate techniques such as multi screen presentations, and live video conversations with experts in the topic of the day, wherever that expert is located, to respond to the constantly evolving digital ability students bring with them to the college setting. Blended learning, as this section has outlined, has a proven track record and represents a significantly viable bridge to connect pedagogical approaches that have been deemed traditional with new technology-based pedagogies, to create a learning setting that responds to students’ expectations of both critical thinking instructional approaches and technological advancement. This approach, as this study will explore further, could connect traditional instruction in a liberal arts setting with a technological learning environment that meets the needs of both the students’ desire for digital learning opportunities and the instructor’s pace and discretion in incorporating these advanced pedagogical approaches.

Digital Tools Available to Liberal Arts Faculty

There now are a number of digital tools available to liberal arts faculty for teaching and assessment. These tools include laptop and netbook computers, smartphones, digital projection units, and presentation software – the latter including PowerPoint, Prezi, and Google Docs. Challenges faculty face with hardware and software include compatibility, instruction, and support in effective usage of the equipment and materials, and the applicability of these elements in a coordinated fashion so that faculty and students may anticipate similar learning outcomes in different courses where these materials are used (Privateer, 1999, p. 65). Additionally, Kengwee
et al. (2009, p. 24) noted that introduction of digital education products likely will also require addressing new teaching methods overall.

Specifically, Mergel (2012) discussed how social media presents different opportunities to a classroom setting within a blended learning approach by rapidly and directly connecting students to practitioners and to both primary and secondary sources, allowing them to learn from firsthand accounts in real-life situations. Class participation elements include the use of social media tools to collaboratively co-create content and to engage in a culture of constant engagement and social awareness between weekly face-to-face meetings in the classrooms (p. 468). A list of “Top Learning Tools of 2014” created by Hart (2017) from the Centre for Learning & Performance Technologies (globally one of the most popular websites for information on digital learning, with over 2.4 million visits in 2016) included Facebook, Twitter, and LinkedIn, but it also mentioned learning tools which might be considered more traditional in the classroom setting, such as PowerPoint, Prezi, and Blackboard Learn. How does Twitter, with its 140-character message limit, fit in with a possibly expansive lecture? Perhaps an instructor can use Twitter to transmit specific class assignments. Faculty members at the institution that served as the site of this study were using Dropbox to allow students to submit assignments through a venue other than Blackboard. A number of college textbook authors have used Facebook to supplement class materials; however, teachers and students using Facebook as a social media communication may run the risk of improper contact and questionable content, thus, a “code of conduct” is necessary.

Interestingly, teacher engagement programs such as Udemy are not on the list of the Top 100 Tools. Similarly, Coursera rated just above the top 50 programs, as affirmed by learning professionals. What is intriguing is that the programs in the top ten, including: Twitter, Google
Docs/Drive, YouTube, PowerPoint, Google Search, WordPress, Dropbox, Evernote, Facebook, and LinkedIn, are popular consumer programs, which presents the need, perhaps, for a host of specialized or customized digital tools for learning and assignments, rather than resorting to “off the shelf” popular culture resources. Weis, et al. (2002) also discussed modifying the traditional liberal arts discussion format by using digital tools such as Facebook, Twitter, and text messaging (p. 156). In addition technology can be used in the liberal arts classroom to access the Internet to explore research that may be an element of almost any course (p. 3).

Retrofitting the curriculum. While the application of technology advances, instructors must become “continuously literate,” so their students also learn new digital proficiencies spawned by emerging technologies (Damico & Baildon, 2011); they must be able to “engage with content and ideas Vis a Vis new technology tools, and [possess] the know how to use the internet to promote critical literacy goals” (p. 234-235). Osterman (2012), who developed a digital literacy theory, defined the components that contribute to this competency: (a) the ability to use digital technology, communication tools or networks to locate, evaluate, use and create information; (b) the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers; and (c) a person’s ability to perform tasks effectively in a digital environment (p. 136). These facets were explored through interviews with participants in this study. The next section of this literature review, in this context, explores the opportunities and challenges liberal arts faculty face in developing these skills to effectively incorporate and apply digital literacy consistently into pedagogical practice.

An overarching concern is the degree of acceptance by liberal arts faculty of the necessity of having at least a working knowledge of digital education tools with a goal of considering the introduction of those tools into their curricula. Ideally, a college will provide training in the
usefulness of digital education programs, and continuing assessments and measurement tools to support their application, system-wide (Georgina and Olsen, 2008, p. 7). Lin and Ha (2009) reinforced the axiom that the appropriateness of a technology in the perception of a user is a primary determinate of the potential user’s choice of technology (p. 567). A digital education tool or device made available in and of itself is irrelevant if an instructor has little knowledge of how to use it or deems it not applicable in his/her instructional mode.

In a study of curricula, Lin et al (2013) emphasized the value of pre-source training for instructors in liberal arts and sciences, peer mentoring to affirm the “comfort level” of instructors integrating technology in their content, and continuing measurements of the efficacy of instructor training as digital content and hardware make further inroads (p. 334). Another challenge is working within college subcultures to encourage and promote integration of technology across the campus and with faculty possessing different integrative abilities (Lin et al., 2009).

**Incorporation of digital tools by liberal arts faculty.** While application of technology has been shown to enhance the learning process for students, there may be a lack of enthusiasm by liberal arts faculty for the use of digital tools (DiConti, 2004, p. 170). Students, however, exhibit strong enthusiasm for these approaches. Benson et al (2002, p. 142) noted that a survey of computer-assisted learning found that students had much more success as collaborative learners when using technology than those using traditional classroom tools, such as books and written notes. The authors cautioned that research is limited as to a wider use of mediated communication in the classroom, but as a learning tool, computer assisted learning appeared beneficial. Additionally, as identified by Kengwee et al (2009), a lack of computers, “backbone” technology infrastructure, and training deflect significant integration of digital learning tools in classrooms (p. 27).
Ideally, college leaders that support programs such as TPACK -- the theoretical framework that provides a lens for this study – can provide a more robust technological backbone on campus; this, combined with faculty development programs designed to enhance technological learning opportunities can strongly encourage faculty exploration of digital based education tools. This presents a challenge, and an opportunity, to allow faculty the time and expense needed to build their basic computer skills, interact with fellow faculty from similar sized institutions, and to receive support from more technologically-inclined faculty leaders on campus to develop dynamic lessons and class interactions that incorporate digital tools, while not diminishing the actual learning and student faculty-interaction that is at the core of liberal arts programs.

Additionally, the concept of integration of digital education technologies may be considered as an element of the larger goal of integrating educational theories and instructional strategies, including metacognition, constructivism, and active learning. Oakleaf and Van Scoy (2010, p. 382) pointed to studies crediting these instructional strategies with encouraging students to ask questions, pursue theories, and seek information and data sources through the digital tools at their disposal, whether on their phones, or on a library computer. If there is a lack of faculty enthusiasm for digital education tools, it may be related to the deficient evidence of the perceived benefit of digital tools for instruction and assessment and the lack of presentation of creative and adaptable digital alternatives.

Alternatively Georgina and Olson (2008) suggested that the faculty’s lack of enthusiasm may be due to a lack of knowledge of how best to use digital tools in the classroom, and they found a correlation between enhanced teacher training and greater enthusiasm for incorporating technology in a classroom setting (p. 3). They suggested that the faculty’s lack of enthusiasm
may be due to a lack of knowledge of how best to use digital tools in the classroom. The authors conducted a study at a medium size public university in an attempt to gain insight into the apparent disconnect between the desire of teachers to enhance their classroom experience with digital tools and their beliefs that they were not getting the support they needed to succeed in introducing software and programs. A majority of respondents agreed their institution provided technology training for faculty, and a majority of those respondents stated that they believed the college should be responsible for training the faculty, as opposed to individuals seeking their own instruction (Georgina & Olson, 2008, p. 5). Faculty who responded were comfortable with the standard types of hardware and software; however, their confidence waned when ranking their comfort level with creating web pages, integrating content into a website, or using social media to conduct a class (p. 6). The authors concluded:

Technology alone does nothing to enhance pedagogy; successful integration is all about the ways in which technology tools are used and integrated into teaching. This, of course, means that faculty must be trained in the use of the tools—not just given access to the tools—integrating new software as part of an interactive teaching and learning strategy (Georgina & Olson, 2008, p. 7).

Available data does challenge this notion, however, and some studies point to positive perceptions concerning the use of, and support for, digital education tools. Buzzard et al. (2011) noted that in a survey conducted by Cengage Publishing in 2009, a majority of both students and instructors believed each had effectively used technology in the classroom, though the authors issued the proviso that some students may have reported on courses where technology was used more effectively by a competent instructor, which may have skewed the results (p. 136).
Given the variables, the positive or negative assessments of the use of technology in the college classroom may mirror the positive or negative conversation students and instructors have about their experiences in any classroom setting. Students who are adept at using at least basic digital technology may be frustrated when the instructor insists on lecturing from notes at a podium, elicits questions, and distributes paper assignments. Faculty may be frustrated at the apparent lack of support from the administration or from the technology specialists who may balk at their requests for more specialized digital tools, as well as hesitating at the price tag for digital equipment and software. This disconnect is real, and it must be addressed before progress on digital upgrades and their application get underway. It is possible institutions, such as the one that was the focus of this study, have decisions to make regarding retrofitting or completely overhauling their technology to meet student expectations, faculty competence, and “marketplace” demands to create access and workability for this form of education.

Summary. This final section of the literature provided an overview of the kinds of available digital education products available to faculty and explored situations where those have been effectively incorporated. It also discussed faculty reticence to inquire about digital incorporation and the challenges they face in moving in this direction, including a lack of training and common discussion institutionally regarding how to integrate new pedagogies and programs.

Conclusion

Small, private, liberal arts institutions, such as the college in which this study was grounded, continue attracting students interested in the traditional approach of critical thinking and inquiry these institutions provide, commonly a Socratic method of instruction with intensive face-to-face, instructor-student interaction, perhaps with minimal use of digital education tools.
However, as previously outlined, students’ expectations about the integration of digital technology in the classroom have increased, yet the incorporation of tools and pedagogies and the implementation of enhanced digital learning have proved wanting, especially for instructors who may doubt the usefulness and relevance of these techniques for their teaching approaches. Some may feel the demand for more digitalization will compromise the lack of creative control of their course designs; others may be curious and willing to incorporate more digital tools, but they may lack the skills to effectively make them work well in the classroom. This propensity for or against incorporation may vary significantly across disciplines, which is one aspect this study explored. An instructor in a beginning journalism class might be more interested in digital education programs highlighting best practices in writing, including possibly being electronically tied into, say, a news conference from The White House; a sociology professor might not perceive an equal benefit. A theologian or philosopher might have quite a different perspective. As this literature review has explored, blended learning programs can become effective tools to both preserve the integrity of the traditional liberal arts approach to teaching, and to integrate new technologies, for an enhanced design of pedagogy. This process – its limits and possibilities -- was precisely the focus of this study.
Chapter 3: Research Design

Introduction

The purpose of this descriptive case study was to explore the experiences of liberal arts faculty at a private, Midwestern college in the United States as they incorporate digital tools into their teaching, and to simultaneously document the strategies faculty, staff, and administrators were using at that institution to integrate digital tools to impact student success. This study addressed how faculty, administrators, and staff at this college approached the incorporation of new technology-based pedagogical practices into traditional liberal arts teaching in the context of a recognized demand from students for digital literacy and technology skill acquisition in addition to traditional liberal arts training. It aimed to understand the efforts made at a private Midwestern liberal arts college undergoing this transition.

Research Questions

The central research question for this study is: What are the experiences of faculty and administrators at a Midwestern liberal arts college as they negotiate the integration of technology/digital learning into traditional pedagogy, educational practices, and institutional structures?

Subquestion 1. What are the components of the history, culture, and institutional practices of a traditional liberal arts institution that either impede or facilitate the integration of technology into classroom teaching?

Subquestion 2. How do faculty members describe the level of technological competence they have to integrate new digital-based teaching methods into the classroom?

Subquestion 3. What are the challenges instructors and administrators face regarding the integration of technology into the liberal arts classroom setting?
Subquestion 4. What kind of resources, training, and institutional changes would be required to support faculty members in advancing digital-based teaching in their classes, as perceived by instructors and administrators at the college?

Research Paradigm

Using the constructivist-interpretivist paradigm, the researcher interpreted phenomena emerging from the interviews with selected subjects, using what Ponterotto (2005) described as interactive researcher-participant dialogue (p. 129). Ponterotto (2005) cited Schwant (1994) in describing the interpretivist view, asserting the existence of multiple, apprehensible, and valid realities, not a single true entity (p. 129). Further, Ponterotto, quoting Schwandt (2000) and Sciarra, (1999), observed that the constructivist-interpretivist position assumes a hermeneutical approach, which maintains that meaning is hidden and must be brought to the surface through deep reflection and researcher-participant dialogue (Ponterotto, 2005, p. 129). The intent of sharing lived experiences is to integrate those experiences into a portrait. In this study, participant experiences were understood with awareness given to the researcher/author’s positionality, and to the faculty, administrator and technical staff description of their beliefs about the value of a traditional liberal arts education, and the role of digital education tools in the classroom, as well as faculty acceptance of – or lack of enthusiasm for – integrating these tools.

Howe (1992) attempted to draw distinctions within the constructivist-interpretivist framework, and to highlight the similarities and contradictions the various constructs provide. Citing Fay (1975) in arguing about the limitations of a qualitative interpretivist framework, Howe (1992) noted that the model neglects: (a) the external conditions that help give rise to systems of actions, rules, and beliefs; (b) the unintended consequences of actions; (c) the internal contradictions between actions, rules, and meanings; and (d) historical change (p. 242). This may
be a persuasive argument concerning a researcher approaching a topic with little to no knowledge of the subjects, settings, and internal “drivers” informing the culture, thus impeding the observation. As a nearly decade-long faculty member at a liberal arts college, this researcher had considerable knowledge beginning this study regarding the technical and cultural challenges of introducing digital education technology in the liberal arts classroom, which eliminated many of Howe’s (1992) concerns regarding the paradigm.

Research Design

A constructivist-interpretivist approach towards understanding the articulated problem of practice lent itself naturally to a qualitative research design. The qualitative approach creates space for the researcher to adapt “flexible, emerging structures and evaluative criteria” (Creswell, 2013, p. 16). As Creswell observed (2013), “Qualitative researchers strive for understanding, that deep structure of knowledge that comes from visiting personally with participants and probing to obtain detailed meanings” (p. 243). Quantitative approaches, in contrast, are more detached from the rich, thick, lived experiences of the participants; the priority in quantitative approaches – statistical analysis and surveys, for example – is measurement, rather than description (Creswell, 2013). Rubin and Rubin (2005), quoting, Seidman (1998), described the importance of interpretation in the researcher-interviewee experience:

Researchers must ask themselves what they have learned from doing the interviews, studying the transcripts, marking and labeling them, crafting profiles, and organizing categories of excerpts. What connective threads are there among the experiences of the participants they interviewed? How do they understand and explain these connections? What do they understand now that they did not understand before they began the interviews? What surprises have there been? What confirmations of previous instincts?
How have their interviews been consistent with the literature? How inconsistent? How have they gone beyond? (p. 124).

Qualitative research, by nature, is exploratory. Creswell (2013, p. 49) described the requirements for a qualitative study, including time in the field, extensive data analysis, and examination of multiple perspectives. Harrison, Macgibbon and Morton (2001, p. 325), meanwhile, pointed to the importance of reciprocity in qualitative inquiry, and established that this approach involves a process of give and take that includes establishing rapport and honoring the participants lived experiences as well as their confidentiality. Being attuned to respondents’ dialogue which may contain statements with hidden non-sequiturs and underlying meaning is an element of what Ponterotto (2005) described as being part of the “lived experience” (p. 129). Smith, Flowers, and Larkin (2009) also stressed the importance of everyday experience in driving the interview process with qualitative participants (p. 32). Smith et al. quoted Halling (2008), who recognized that “each of us is a phenomenologist insofar as we listen to the stories people tell us, and insofar as we pay attention to and reflect on our own perceptions” (p. 148).

In discussing the qualitative method in research, Nolan and Talbert (2011) noted that the researcher must carefully consider his or her role in utilizing epistemological inquires and assumptions, as those assumptions “impact the way the researcher thinks social phenomena should best be studied in order to be able to represent the most truthful depicted interpretation of the data.” Schwandt (2007) asserted that the researcher must essentially ask, “How do the researcher and the participants know what they know to be true?” (p. 266). This researcher’s intent as the investigator was to interview faculty, staff, and administrators to explore their views regarding the impact of digital education tools in the liberal arts setting of one institution, and
ascertain the relevance and usefulness of those tools and applications to the liberal arts classroom from the perspectives and experiences of the participants.

Creswell (2013) stated that the role of the researcher in a qualitative study is to collect data through examining documents, observing behavior, and interviewing participants (p. 45) in the natural setting. Creswell further discussed the process of the development of a comprehensive set of themes, based on interpretation of the acquired data, which emerge during interactions between the participants and the researcher. Rubin and Rubin (2012) referenced exploratory studies where respondents may relate unanticipated material, which may be relevant to the study (p. 122) given the continuous feedback, which may emerge from the three questions and answer sessions germane to a descriptive case study.

Research Tradition

Of the traditions available to qualitative researchers, this study is best aligned with the tradition of a descriptive case study. Yazan (2015) observed that Yin (1994) advocated that the design of case study is rigorous and is a legitimate methodology to conduct inquiries into a theoretical proposition. According to Creswell (2013) case studies within the qualitative methods approach are conducted in a “natural setting…they often collect data in the field at the site where participants experience the issue or problem;” in this context, they “do not bring individuals into a lab (a contrived situation), nor do they send out instruments for individuals to complete, such as in survey research” (pp. 44-45) The natural setting for this study was the private liberal arts college which permitted the researcher to have direct contact with, and discussions with, selected participants to “gather up-close information by actually talking directly to people and seeing them behave and act within their context” (Creswell, 2013, p. 45).
Thus, the research was conducted through the use of a descriptive, nested case study. Starman (2013) described a nested study as comparing elements within one case (p. 33). The author uses the example of observing three hospital “wards” as part of a study of a larger hospital operation. The three wards are considered “nested” as they “provide an integral part of a broader picture” (p. 33). This “nesting” approach was appropriate for this study because the researcher extrapolated a comprehensive picture by interviewing faculty, staff, and administrators, and by examining their different experiences with technology, in specific liberal arts segments as part of a broad examination of the tension between traditional liberal arts instruction and pedagogical approaches using digital education tools. As part of a test of elements of cultural theory, nested studies are beneficial in grouping a few specific responses in a larger case study (Verweij, Luan, & Nowacki, 2011) which proved to be a valuable tool for this study on the implementation of digital tools in a liberal arts setting.

A case study involves identifying the reality the researcher enters into when interviewing participants Yazan (2015) quoted Merriam’s (1998) description of the challenges researchers face in making sense of that reality:

The researcher brings a construction of reality to the research situation, which interacts with other people’s constructions or interpretations of the phenomenon being studied. The final product of this type of study is yet another interpretation by the researcher of others’ views filtered through his or her own (p. 139).

Further, Yazan (2015) citing Yin (2002), defined the elements researchers employ: “case study research design is comprised of five components: a study’s questions; its propositions, if any; its unit(s) of analysis; the logic linking the data to the propositions; and the criteria for interpreting the findings” (p. 140).
Participants

Faculty from liberal arts specific disciplines, administration, and appropriate support staff in positions to discuss the opportunities present with digital learning programs in the classrooms, and the challenges-- cultural, structural, and technical -- involved in launching these programs, were interviewed for this study. To triangulate data, the researcher informally conducted participant observation, visiting classrooms and attending faculty meetings where traditional and nontraditional teaching techniques and programs were discussed or used. These observations supported the individual comments from the participants involved in one-on-one interviews and the archival analysis.

Rubin and Rubin (2005) discussed creating “main” and “follow up” questions, with an emphasis on developing questions with “conversational language” as a given (p. 132). The authors presented the scenario of a survey of average individuals. In this case, the researcher interviewed academics, administrators, and technical staff which necessitated more precise and topic-driven questions, and moderate discernment and tailoring of the questions for each group (p. 133) (see Appendix E).

The researcher aimed to interview 10-15 individuals (faculty, administrators, department chairs, IT specialists/support staff) selected through purposive sampling from both the college in general and specifically the departments most aligned with a traditional liberal arts education. The respondents were chosen from: Philosophy, Theology, Business, Journalism-Mass Communications, Nursing, and Psychology, which were part of foundational courses in the liberal arts setting. A 1970 study from the Carnegie Foundation for the Advancement of Teaching identified the courses most identified with a classical liberal arts education (Ferrall, 2011), p. 9). They included the foundational courses from which this researcher drew
The majority of these classes represented edifying examples of the way liberal arts have been traditionally taught: lecture/discussion/assignment. Examining the ways in which these instructors, staff, and administrators were or were attempting to integrate information technology into pedagogy provided an acute edge from which to study the phenomenon.

**Recruitment and Access**

To launch the process of investigating the implications of integrating liberal arts instruction and digital tools in the classroom, the researcher sent a request for permission to conduct the study to the dean of the college. This request for permission included seeking access to send a campus wide email to all faculty members, asking if they would be willing to participate in this case study. The researcher also asked the dean to provide written permission for this access and contact information for the purposes of the Northeastern University Institutional Review Board (IRB) process and the college’s own IRB requirements (see Appendix A). Participants were recruited via campus-wide email (see Appendix A) following the aforementioned clearance from the dean. The pool of potential faculty participants was sent a solicitation letter, describing the background of the study, methodology, and a request to set a time for interviews (see Appendix A). Those who agreed to participate were asked to sign a consent form (see Appendix B), acknowledging they had been informed of the elements of the study and their rights as participants. Upon consenting to participate, appointments for interviews were created, and the researcher and interview subjects agreed on time, location, and length of the initial interview.

**Data Collection**

*Survey.* Taking into account that few faculty in the interview population had been formally queried regarding technology use, the researcher produced a series of questions and
answers informed by the TPACK theoretical framework and featuring a basic description of digital educational tools and software, as part of a survey of faculty, staff, and administrators at the college concerning traditional liberal arts practices (see Appendix C). The questions included indirect references to the TPACK theory, and bullet point queries soliciting information regarding technology and pedagogy from the respondents. This survey allowed the researcher to complement in-depth interviews to some degree, and it was sent by email to all faculty members to determine a general level of computer-assisted tools that existed in the classroom. Despite multiple efforts to encourage faculty to respond to the survey only five completed it. Because of the limited response (see Appendix D), the researcher used the survey data results for general background informing the interview questions and overall site analysis.

**Interviews.** The primary method of data collection for a case study was interviewing (see Appendix E). Rubin and Rubin (2005) recommended in-depth interviews with a semi structured format. Using a semi-structured interview format allowed respondents to comment beyond the planned questions and direction of the conversations permitting the researcher and the participants to informally draw out categories, patterns, and themes. Participants were interviewed approximately 30 minutes, some longer. The researcher conducted no follow-up interviews.

Conducting the interviews required listening skills to capture both what was said by the interview subjects, and its meaning in the context of their “meaning” making (Creswell, 2013). Creswell (2013), discussing the creation of a qualitative study, outlined that interviewers bring broad assumptions to the data collection process and use an interpretive lens to engage with participants as they present their questions; simultaneously, the researcher draws an interpretation not only from the actual response, but also from the “sense” of that response (p.
Sense making is integral in the success of gathering first person data: both the actual commentary and the iterative, interpretive processes are key.

During the interviews, subjects were asked to respond to both open-ended and more detailed, specific questions related to liberal arts and the incursion of digital education tools (see Appendix E). In this sense, the researcher and the interviewee participated in what Smith, Flowers and Larkin (2009) termed “a conversation with purpose” (p. 57). Additionally, the researcher and interview subjects were both active participants within the research process allowing for leeway for the participants to take the interview to “the thing itself” (p. 58). Interviews were recorded with a Marantz PMD 660 digital audio recorder, and a special digital data card, both kept exclusively for interviews and stored securely. All digital interview recordings were fully destroyed after the interviews were transcribed. Recordings of the interviews were sent to a commercial service, Rev.com, for transcription, using pseudonyms only for identification purposes.

Archival research and document analysis. The researcher further triangulated the interviews and survey examining any available documents and artifacts related to the historical integration of information technology in the classroom setting, including early incorporation of televised lectures, training documents, instructor reports of new use of computers in the classroom, policy and budget documents regarding the integration of digital technology, yearbooks, college newspapers, and promotional materials regarding early and later uses of new technologies.

Data Storage

Creswell (2013, p. 175) noted that research-oriented publications do not always pay careful attention to issues regarding data storage and management. The author, recognizing the
importance of proper data maintenance, created a specific plan for data collection, storage, and management. Only the author and, for the purposes of validity and credibility, the principal investigator (the author’s academic advisor, if she requested), had access to collected data. The electronic results were kept on secure flash drives, and on a Western Digital My Cloud personal storage unit in a designated secure location. The data was password-sensitive, with only the author and the principal investigator having access to the password. Transcripts, which were digitally recorded and transcribed, were kept secure in a locked file cabinet. Those flash drives were scrubbed of the information and, upon completion of the project and its approval; the transcribed material was shredded or otherwise safely disposed of.

Data Analysis

Analysis of the survey results. Of an email list of dozens of potential respondents, the survey elicited only five responses to all four questions, and one additional respondent completed survey question #4 only (see Appendix D). Given the small sample size, the transferability of this small sample of faculty to the larger faculty population is extremely limited. Thus, the researcher opted to use the survey data primarily as background information for the study, and to inform the questions. While the number of responses was not significant, the material aligned directly with the data analysis of the interview transcripts revealing patterns similar to the themes discerned from coding of those texts (see Appendices D and F).

Analysis of the interview transcripts. The request for interviewees was elicited by a mass email communication to all faculty and administration (see Appendix A). The initial email communication, at a two-week time period, resulted in the recruitment of only five volunteer participants which the researcher attributed to timing – the email communication requesting participation coincided with the beginning of the school year. The college administration granted
permission for re-submission to the faculty at the third week mark, resulting in a total of 12 individual faculty and three administrative interviewees agreeing to participate. Copies of the interview protocol for administrators, faculty, and IT personnel can be located in Appendix E. The interview questions were standardized by the faculty or administration participants. Since there were 12 faculty and three administration/staff interview participants, there was a careful review of the transcripts of each respondent, followed by the next respondent, though in no specific order. The researcher determined that the planned interviews were intensive in exchange and extensive in response; given this outcome, multi-level interpretation presented nuances concerning either reticence or enthusiasm regarding faculty responses to the state of liberal arts and digital education tools.

Administration and faculty interviews were transcribed by Rev.com, and uploaded into MAXQDA 12 coding software. The researcher conducted the first round of coding by implementing in vivo coding, which is described as codes being taken directly from the data, representing living language, including slang and metaphors (Seale, 2012, p. 372). Respondents’ use of computer terminology, as well as their familiarity with digital educational products and their professional experience in their application in a liberal art setting, were identified. First round coding nomenclature resulted in highly generalized themes. Creswell (2013, p. 184) identified this aggregation in terms of “tentative” codes from which the researcher discards to proceed to a “lean” coding list. Using this approach, supported by the MAXQDA 12 software, the researcher narrowed the coding classifications to the more common domain titles and sub-titles. This resulted in 21 distinct coding categories across the aggregate interview responses, with a total count of 162 within the narrowed domains and sub-domains (see Appendix F).
The second round of coding involved axial coding, including the comparison and reorganization or the focusing of the codes into categories, and the prioritization subsequently of them into “axis” categories (Saldaña, 2013, p. 52). The second round allowed the researcher to more closely review response comments that affirmed first round observations from faculty and administration.

Creswell (2013) points to “in vivo” coding as bringing out the exact words expressed in interviews (p. 185). Creswell further described the significance of deconstructing information during all cycles:

- Dismantling a dichotomy, exposing it as a false distinction. In this case, interviewees concentrated on tools and instructional techniques where they were able to use technology, if they were inclined to do so. There was no underlying college-wide culture directing technology adoption or rejection.

- Examining silences – or what is not said, that is, noting who or what was excluded by the use of pronouns, such as we. It should be noted that the only participant using the term “we” as opposed to “I” was a member of the college administration. The participants spoke directly about their individual experiences.

- Attending to disruptions and contradictions, or places where a text fails to make sense or does not continue. Given the familiarity respondents had with their particular technology practice, or lack thereof, there was no identified contradiction in how faculty approached their interest, or lack of interest, in its classroom implementation.

- Focusing on the element that is most alien or peculiar in the text, what is conceivable or permissible. The participants were frank and did not exhibit any hesitancies in expressing their perspectives. The outlier among the respondents noted it was permissible to reject
technology use outright in the classroom. This respondent did not self-identify as an outlier.

- Interpreting metaphors as rich sources of multiple meanings. This was limited; most interviewees gave direct answers to questions, without speaking metaphorically or indirectly.
- Analyzing double entendres. Again, respondents gave direct answers, not hiding meanings in double meaning terms.
- Separating group-specific and more general bias by “reconstructing” the text, with substitution of its main elements (p.186-187).

An open coding strategy was used for the initial coding. Initial coding, as referenced by Saldaña (2013), included structural coding which involved exploring interview segment commonalities, differences, and relationships. In vivo coding was employed to draw the participants’ own words as codes (p. 84). This form of open coding allowed for a general review of comments. Next, specific words and phrases were be marked for follow up in the axial coding section, while selective coding determined the core variables of the comments and observations. Pattern coding was used in that second round of coding (Saldaña, 2013). Patterned coding presents the opportunity to extract major themes from the data, seeking out the rules, causes, and explanation for the data, and developing theoretical constructs and processes extrapolated through the closer extraction of words, phrases, and patterns of reaction based on the deeper discussions with the respondents (see Appendix F).

**Trustworthiness**

The researcher strived to adhere to the utmost standards of trustworthiness in data collection, assembly, management, and supervision, following Creswell’s (2013, p. 250)
established methods to safeguard the trustworthiness of data. This research indeed yielded thick-rich description with the author presenting detailed commentary about specific descriptions of unnamed participants in qualitative interviews (p. 252), and triangulating information through participant observation and document analysis. Creswell (2013) described member checking as the researcher soliciting input from participants concerning the validity of the findings (p. 252) through review of the actual transcripts and of the themes developed. The researcher provided the opportunity for member checking, incorporating all corrections and amendments offered; he also plans to present the study’s results through workshops and forums at the institution for diffusion and discussion.

Protection of Human Subjects

Participation in the study was voluntary, and the participants were fully informed of this before they formalized their involvement (see Appendix B). The following steps were used to protect the participants. The interviewer presented a full application including a list of questions to the IRB board at both Northeastern University and at the College to determine whether the questions were too sensitive as to potentially cause privacy and security concerns (Creswell, 2013) No data collection began until both IRB approvals were in place. Respondents had their confidentiality protected through the entire research process; the use of pseudonyms will continue in any future publications or presentations to assure ongoing confidentiality.
Chapter 4: Results of the Findings

Introduction

The purpose of this research study was to understand the experiences of faculty members and administrators at a small traditional liberal arts college in the Midwest as they negotiated the integration of technology/digital learning into traditional pedagogy, educational practices, and institutional structures. This chapter reviews the findings synthesized from document analysis; individual, face-to-face semi-structured interviews with members of the administration of the college, including the president, dean, and director of instructional technology; and a survey tool shared with faculty to answer the central research and sub-questions that follow.

Research Questions

What are the experiences of faculty members and administrators at a liberal arts college in the Midwestern region of the United States as they negotiate the integration of technology/digital learning into traditional pedagogy, educational practices, and institutional structures?

Sub-Question 1. What are the components of the history, culture, and institutional practices of a traditional liberal arts institution that either impede or facilitate the integration of technology into classroom teaching?

Sub-Question 2. How do faculty members describe the level of technological competence they have to integrate new digital-based teaching methods into the classroom?

Sub-Question 3. What are the challenges instructors and administrators face regarding the integration of technology into the liberal arts classroom setting?

Sub-Question 4. What kind of resources, training, and institutional changes would be needed to support faculty members in advancing digital-based teaching in their classes?
Participants

The study participants were recruited by an email invitation sent through the college (see Appendix A), prior to the opening of the 2017-2018 academic year. These participants included three administrators and twelve faculty members. All were full-time employees of the college at the time of the interviews. The administrators included one female and two males, all of whom had been at the college at least five years. Faculty respondents included six males and six females; the individual who had been at the institution the longest had 25 years’ experience, and the shortest in time was a second-year instructor. Disciplines included: journalism and mass communications, psychology, criminology/sociology, nursing, history, modern languages, education, philosophy, and theology.

Administrators. The following administrators participated in this study.

“A” had been at the college 14 years at the time the interviews were conducted, serving that entire stint as the president of the college. In that role, he was responsible for being “the face” of the college, fundraising, and taking responsibility for the direction of the college, as well as working directly under the board of directors. The president had graduated from the college and had served on the board of directors for a number of years prior to being appointed as the chief executive.

“B” had been serving as dean of the college for 20 years when interviewed, and he had been a small college faculty member at a different institution prior to accepting the college position. The dean was teaching one political science course a semester to keep “in touch” with the classroom.

“C” was serving as the director of instructional technology and had held that position since 2012. Prior to that appointment, “C” was a member of the IT staff, and his roles at the time
the study was conducted included planning for continual internet service upgrades on campus.

He considered his biggest challenge to be the maintenance and improvement of an “on demand” online system, especially a robust Wi-Fi system across the campus.

**Faculty members.** The faculty members interviewed are described in Table 1.

Table 1

*Faculty Member Participants*

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Teaching experience</th>
<th>Other information</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Psychology</td>
<td>25 years</td>
<td>PowerPoint and Blackboard student postings.</td>
</tr>
<tr>
<td>102</td>
<td>Philosophy</td>
<td>14 years</td>
<td>Blackboard instant quizzes, some videos.</td>
</tr>
<tr>
<td>103</td>
<td>Foreign Languages</td>
<td>2 years</td>
<td>Use of digital language lessons.</td>
</tr>
<tr>
<td>104</td>
<td>Business</td>
<td>26 years</td>
<td>Textbook-based interactive assignments.</td>
</tr>
<tr>
<td>105</td>
<td>Nursing</td>
<td>12 years</td>
<td>Digital healthcare simulation programs.</td>
</tr>
<tr>
<td>106</td>
<td>History</td>
<td>9 years</td>
<td>Completely reticent to technology incorporation.</td>
</tr>
<tr>
<td>107</td>
<td>Exercise Science</td>
<td>18 years</td>
<td>Blackboard and PowerPoint use.</td>
</tr>
<tr>
<td>108</td>
<td>Journalism and Mass Communications</td>
<td>24 years</td>
<td>Extensive digital tool use in class, as well as creating interactive programs.</td>
</tr>
<tr>
<td>109</td>
<td>Foreign Languages</td>
<td>20 years</td>
<td>Digital flash cards for language immersion.</td>
</tr>
<tr>
<td>110</td>
<td>Theology</td>
<td>8 years</td>
<td>YouTube videos and PowerPoint use.</td>
</tr>
<tr>
<td>111</td>
<td>History</td>
<td>30 years</td>
<td>Videos outlining historical events, PowerPoint in class.</td>
</tr>
<tr>
<td>112</td>
<td>Education</td>
<td>11 years</td>
<td>Interactive programs for master’s level education majors. Digital training for undergraduates.</td>
</tr>
</tbody>
</table>
Findings

Survey results. As previously explained in Chapter 3, only five faculty members completed the survey despite two email attempts to draw in respondents. The years of service of the individuals completing the survey – five faculty members from five departments -- ranged from one to 18 years. The respondents indicated potential benefits of incorporating educational technology into the classroom setting, although this cannot be adequately quantified from the survey results, which served primarily as background data. Participant feedback regarding obstacles to introducing educational technology involved learning distractions and comments associated with available technology. The comments that were included in the survey aligned directly with the data and themes uncovered through the interviews.

Interviews. The analysis of the coded interview responses confirmed the lack of adequate infrastructure, educational technology, and instructional technology available on the campus. Interviewee responses indicated issues with lack of system-wide instructional technology support, digital educational programs across departments, and, at times, undependable internet service. The following direct quotes illustrate reflections from the participants in response to queries regarding the level of agility available for incorporating hardware, software, and instructional technology pedagogy:

- I know that faculty who are very knowledgeable about it, they do share their knowledge in workshops and different faculty colloquiums and those things, but it’s usually optional and probably not enough of us have the time to do it.

- It's a big help to be in a modern building with new classrooms, where there are screens and good projectors, and good connections. I've taught in other classrooms where it would have been impossible. Even on campus, there are some classrooms where the
equipment doesn't work well enough or isn't conducive to showing a movie, or listening to a song.

- I think better faster Internet on campus is the main thing. We spend a lot of time waiting for things to load, unfortunately, or it feels like it is one of my frustrations. I'd like to see some more seminars and presentations about what my colleagues are doing, too. I know other people are doing really interesting things.

- I haven't really seen a big push across the college, really, for a lot of technology. I think most of them ... a lot of people use PowerPoints, and what-not-have-you. I think to some extent, there are some infrastructure problems that prevent it.

- At the simplest level a more dependable network and ... including wireless network ... I hear a lot from my students about the limits of our network and our wireless capabilities, so frankly, investment in the technological infrastructure I think would be the most basic improvement that the institution could make.

- I know that there are a lot of people who are probably doing a way better job of incorporating technology into their teaching than I am. I do know that there are a lot of people on the faculty who I think overuse ... the PowerPoint kind of thing in their delivery of the material.

Nearly 47% of interviewee responses indicated issues with lack of adequate infrastructure and of educational and instructional technology or services. Users who participated in the interviews reported having difficulty using digital education products in the classroom, due to the perceived inadequate infrastructure in available classrooms. Infrastructure and online capability were identified as critical components of digital instruction viability, emerging as the first theme.
**Superordinate theme 1: Infrastructure.** The research reviewed for this study identified digital infrastructure as the technological and online underpinnings which the campus needs in place and functioning to operate smoothly. Infrastructure may include hardware, wiring, and connectors that tie campus buildings together in a common system, connected to a larger routing device which brings in the internet signal to the IT department, and distributes it from there.

**Internet access.** Interviewees expressed the perception that the technological infrastructure available in classrooms was inadequate. A technology specialist explained his view that this was in part because of the disconnection that existed between technology demand and the college academic priorities:

"[The College] has been around a long time, has certain principles and technology, although it is becoming more and more prevalent on … campus, it still going to take a while because of where they've grown from. It's a liberal arts college, so you don't have the classes that would offer a lot of technology as well."

Similarly, a college staff interviewee added: “The college is always looking to upgrade…our technology infrastructure because demands placed on it are constantly increasing. We recognize that if we were to add additional electronic tools, we would have to support them through our IT infrastructure.” Additionally, a long-time faculty member added their concern about being ahead of demand by students and other faculty for adequate online services:

"I think what will drive a lot of it is that, and I would like to see the college be more proactive in that, as opposed to eventually, someday, becoming reactive. Like, "All of a sudden, now, we've got to do this to make ourselves relevant." So, I think that's the one thing that … If I had a shoebox, and could get up on it, and tell the college, "This is
something that I think you need to pay attention to," then that would probably be it, but I
don't know how relevant it is to them, so we'll find out.

Faculty and staff who were interviewed generally concurred that the college had invested in what
they considered adequate internet infrastructure; however, to allow more advanced programs and
equipment to operate in classrooms and other campus spots, there was a need for dedicated
funding to accomplish that task.”

A faculty interviewee said they believed in and supported a basic injection of technology
in his classroom:

Having videos and the ability to project videos is very helpful because we're looking at
cultures that the students have no experience with, have not seen, and yet seeing what
they do in a World Religions class really helps you to understand their ideas. I use
technology mostly to show videos where those are relevant or to play a song where it
illustrates a point, but I think that's about the extent of it.

That faculty member’s comments were echoed by another professor also comfortable with using
basic technology:

The only impediment I can see sometimes I have in the past sometimes overused
PowerPoints, and I find that students sometimes become somewhat zombie like in the
classroom if there's too much PowerPoint use……. I’m not really one of those people
that will use technology just for the sake of technology. My smartphone is not very smart
because I don't put hardly any apps on my smartphone. But technology really facilitates
ease of presentation.

Faculty and administration respondents agreed an internet infrastructure which functions with
little down time and few operational failures was necessary for the college campus, when
interviewed in 2017. The college’s long term white paper listed, as a priority, that efficient and dependable technology on campus was essential, and that an efficient internet operation was at the root of the effectiveness of digital tools in classrooms and residence halls.

Assorted faculty members saw limited technological activity as sufficient to present their course content; technology as a distraction was a concern. In this sense, Balkun (2011) discussed the potential conflicts in a classroom where both instructor and student have ready access: Some instructors have addressed the problem by forbidding laptop use outright; others take the position that whether or not a student pays attention is up to him or her, and that there will ultimately be consequences for lack of attention in the form of poor grades. (p.17)

Dahlstrom (2015) addressed the issue of technology misuse, quoting from a study of classroom technology conducted by the Education Center for Analysis Research, demonstrating student beliefs that faculty are adequately prepared, technology-wise, to conduct their classes, and a majority of students say their instructors effectively use technology to support academic success. Further, the report noted:

At institutions that provide support for faculty to use the technologies the faculty chooses to implement, students are more positive about their instructors’ integrated use of technology. Students reported that more of their instructors use technology effectively to support academic success and more have adequate technological skills for teaching at institutions that support faculty choice in technology use (p.11).

This may be an ideal; however, based on specific feedback from interviewees, significant challenges were present regarding technological access, dependability, and training. The notion of faculty choice in available technology was demonstrated from the data as lacking at the college, because of insufficient infrastructure and training. Regarding technology assistance, a
faculty respondent commented on the lack of consistent training in instructional technology and program applications:

I know that faculty who are very knowledgeable about it, they do share their knowledge in workshops and different faculty colloquiums and those things, but it’s usually optional and probably not enough of us have the time to do it. If it was built into faculty workshops and those things where we had to be there, then it would be more beneficial.

Another faculty member from a different department commented that limitations existed; however, in simply introducing “the next new thing” he said, “I definitely think I could add more technology, but I don't want to add technology for the sake of adding technology.”

For another faculty member, the structure and operation of the technology inhibited wider use:

I think better faster Internet on campus is the main thing. We spend a lot of time waiting for things to load, unfortunately, or it feels like it is one of my frustrations. I’d like to see some more seminars and presentations about what my colleagues are doing, too.

Throughout the interviews, this opinion was repeatedly echoed.

**Summary.** The institution had upgraded the campus infrastructure as demand for more sophisticated internet service had increased. The system was handling not only college-installed personal computers, but laptops, smartphones, and tablets, used by faculty, staff, and students nearly around the clock. Faculty wishing to upgrade their lessons and who wished to increase their level of classroom interactivity were concerned the internet system was constrained by the increase in “casual” online activity, while other faculty cautioned against adding technology for technology’s sake.
Superordinate theme 2: Educational technology.

**iPad introduction.** Educational technology includes the tools, such as iPads, laptops, “platform PCs” and mobile devices that enhance instruction in various settings, including a traditional classroom, or any site on campus. Educational technology also, and importantly, includes course-specific software, lesson plans, interactive activities, and multi-media programs designed to enhance traditional learning in a liberal arts classroom. In fall 2015, the institution that was the site of this study partnered with Apple Computer to offer all interested faculty the opportunity to use an iPad “mini” tablet to create content and present that material to students who were given, or who owned, an iPad. Having an iPad mini was not a requirement in a class, and there was a personal computer version that non-iPad students could access. Faculty interest in iPad usage, outside a specific Mac user group, was very limited, and the experiment ended during the school year without much success. Participants attributed the failure for the initiative to take off in part to an absence of educational technology and training.

Apple-centric faculty appeared a bit more savvy with technology than non-Apple users, and they said they were creating their own presentations and programs for students; however, limitations still existed:

I have an Apple TV, so occasionally I'll have my students throw up whatever's on their device up onto the Apple TV, things like that. But it's all really superficial. And I'm sure there are better ways to be using it inside the classroom.

An Apple iPad supporter noted resistance to wider use of technology for technology’s sake on campus from not only faculty but also from students. As one administrator observed:

When we launched the iPad project, there were some classes where students got iPads but the teachers were for whatever reason, maybe largely because of the nature of the
discipline, weren't able to add a lot of value to the course. The students really didn't want anything to do with it. They said, "It was a waste of time, this is stupid you know. We don't want to pay more tuition to get iPads that are not going to be really used any more than gadgets."

Faculty and students, possessing a diversity of experiences and skills levels in using technology, identified that a disconnection existed between the sophistication of the tools and both student and faculty capacity to put them to good use. Many opined that implementation without training was unreasonable, and in some cases, they said it was a futile waste of resources.

**Software.** Faculty interviewees expressed the concern that various types of digital software available might not operate correctly on college provided PCs, and, given the lack of standards in types of hardware used by instructors, the concept of a standard for digital learning tools was not in place, and there were not any directives regarding their role in a traditional liberal arts classroom. Along these lines, faculty and administrators indeed noted that concerns about privacy, ethics, and morals related to the use of technology had not been thoroughly discussed or scrutinized in the campus community. For example, as one professor explained:

I think it would be interesting, and this might be the theologian in me, I think it would be interesting to have a discussion about the ethics ... Maybe that's too hard of a word, but the ethics of having 18 to 22-year-olds ... mandating 18 or 22-year-olds to create a virtual presence, and give themselves a virtual identity. Put out there to their world their thoughts about controversial issues, when they're so young. And in that sense, define themselves for years going forward.

**Summary.** Faculty interviewed for this study considered educational technology, driven by iPads and by other products, to be one tool in their classroom tool belt. They recognized that a
growing number of interactive educational software programs were available and usable on the campus; however, these faculty (and staff) pointed to the lack of training in how to utilize these programs as a barrier to technological integration. Another obstacle was proficiency in operating these systems in a classroom which may or may not be optimal for Wi-Fi or other high level internet use. A percentage of these faculty said they believed that, until these issues were addressed, it was probably not feasible and practical to implement programs such as the iPad and accompanying educational technology programs.

**Superordinate theme 3: Instructional technology.** Instructional technology includes not only educational software and programs that may enhance learning in the classroom, but training for faculty who may want to create their own lessons or build on a publisher’s course material. Training programs for faculty may be informal meetings, or one-on-one personalized instruction. Instructional technology specialists are not usually dedicated to designing programs to replace in-person classes; their intent is to assist in the design of elements of a course which have the potential to expand beyond a lecture-discussion format.

**Student engagement.** Interviewees’ expressed that for both students and faculty, the use of technology in the classroom had the capacity to either support or hinder student engagement in their own learning; this was largely contingent on faculty members’ levels of resistance or discomfort with integration, and how certain tools were used. Those concerns included faculty who expressed disdain for any instructional mode outside of the traditional lecture, and their teaching style included only physical textbooks and typed assignments. Some faculty members admitted they saw limited value in a large-scale introduction of technology; a senior administrator concurred, noting that savvy technology on the liberal arts campus did not necessarily represent an incentive that would increase student enrollments because they were
largely attracted to the college because of its size and religious/ethical orientation. As an administrator noted:

> We believe in educating our students within a community of faith and scholarship, and we believe a community is built best through individual one-on-one relationships. When you move away from developing one-on-one relationships between the faculty member and the students and rely on devices to transmit information, I think that you lose a little bit of the magic of education, personally.

This apparent conflict between technology and traditional learning styles was reflected in the results of a study conducted by Carter, Greenburg, and Walter, faculty members in economics at West Point. The results, presented by the researchers in the publication *Inside Higher Education* (Straumshein, 2016, p. 3), indicated a variety of reasons for poor student performance, including the possibility that digital note taking is actually highly ineffective compared to traditional methods of recording information. This also linked to the possibility that professors teach in a different fashion when students bring laptops and other devices; and the amount of “endless distractions” available to students online creates a negative environment for learning. Despite general impressions that technology serves to connect young learners, Case (2008, p. 325), quoting Mann (2001), identified seven perspectives that identify the sources of alienation in student learning as much more complex with technology, in fact, perhaps contribution to alienation. The first four main components of student alienation related to student technological use included:

- Alienation as a result of the post-modern focus on utilitarianism, functionality, and competence.
• Alienation as a result of the ways in which academic discourse constructs student identity.

• Alienation as a result of the experience of being an “outsider” in the academic world.

• Alienation as a result of a context which requires compliancy rather than creativity.

Thus, as the data in this study revealed, in sync with the components of alienation, the obstacles instructors faced included not only distractions from technology, but a variety of motivational problems students exhibited because of the potential impacts use at different levels was having on the way they learned, which were difficult for instructors to manage effectively.

**Student/faculty resistance.** Along the same lines, but related to resistance, a faculty member self-identified as “anti-technology” outlined the broader issue of student versus faculty expectations in classroom delivery: “They aren't as actively engaged in thinking, so you give them a PowerPoint presentation ... They want you to give it to them. They want to be spoon fed, they don't want to be to actively engaged in thinking.” The faculty member had additional concerns about constant connectivity on campus: “The kids can all buy all the stuff that they have. They do it too much. The reason we're having Wi-Fi issues is because they're gaming. That means they're not studying. They're not reading books.” This faculty member was outwardly averse to increased access to and implementation of technology.

A different faculty respondent, who used technology sparingly in the classroom, explained their rationale for minimal use and also expressed concerns:

With the engagement and the outcomes ... I think with some of the technology, some of the students are just overwhelmed. And I've always said technology's great, but I don't use it just to use it. It has to present some learning. But I think for some of our students, it ... They haven't grown up as computer savvy, so it's been a struggle for them.
Another faculty interviewee noted external distraction conflicts due to the use of personal devices stating, “Dealing with those kinds of issues of distractibility and break down of community and inhibition of learning is really something that has to do with the social role that technology plays.” Yet, another faculty member pointed out that technology is an integral part of this generation’s lives and using it as a learning tool cannot just be dismissed:

I think we probably have to recognize that we are educating digital natives and young people that grew up with technology, so they're used to learning with technology, they're used to the technology itself. I'm not saying that's a good thing or a bad thing, I'm just saying it is what it is.

Overall, resistance full stop to any introduction of technology emerged as minimal, but when it was expressed, the faculty members were direct. Another faculty member admitted scant use of technology in the class setting: “I use technology mostly to show videos where those are relevant or to play a song where it illustrates a point, but I think that's about the extent of it.” A faculty member who described themselves are more immersed in online programs and more robust technology implementation expressed a concern that factions which oppose enhanced use of technology were frustrating attempts to improve digital adaptation:

I think there's somewhat of an inherent vice in the college, that "That's not how we did it in the days of Thomas Aquinas, so therefore, it's not how we do it today.” You know what I mean? And I don't think that's necessarily a bad attitude... In their minds, it's legitimate to question digital devices as part of the learning setting.

In this context, however, a faculty respondent who said they were comfortable with a certain level of interactive technology observed that the use of “one size fits all” digital tools was not realistic:
Well, if we think about a classroom, and of course, everyone has access in our physical space, there's left-handed desks for left-handed people, there's wide doorways for someone in a wheelchair, but if we think about the construction and architecture of lesson design in the same way that we think about building principles, if I'm designing an academic lesson that everybody doesn't have access to, I'm screwing up.

One department chair was clear about how to address many of these concerns – the hiring of an instructional technology specialist and a team who could support faculty members at any level to implement and effectively use digital resources in their classrooms to meet liberal arts academic priorities. In short, the resistance was not necessarily related to technology, per se, but to the gap of both knowledge and ability of the faculty to make the technology work for their curriculum content prerogatives, rather than to morph curricular priorities to fit the available technology:

I think they really need to hire an instructional designer. They need to have a staff of people, probably more than one, who could go around and assist people with creating this type of content. If you look at places like the University of Kansas Medical Center, for their teaching staff, they have a staff of several educational technologists and instructional designers, who do just that.

Finally, another department chair saw the need for training and for a shift in beliefs, both which could combine to create an environment where the traditional teaching approach and technology could be mutually supportive for instructional excellence, in short, for blended learning:

Another I think that is the biggest thing, if we're thinking what could the college do different to enhance that, anything the college could do to support that mindset, to support that shift in people's thinking. I don't know if that's something that could be administered, but certainly there are opportunities to have those discussions.
Thus, the need to both implement changes in thought, accompanied by practical training and adequate technological infrastructure – or to at least broaden these discussions – were clearly established from the data.

**Summary.** Instructional technology is not meant to replace personal in-class instruction. It is not a program that is switched on at the beginning of class and turned off at the end of an hour. Ideally, instructional technology is comprised of a set of personalized learning modules an instructor may use to enhance classroom material and to direct students to seek out specific information for assignments and projects. Ideally, the data revealed, it is enhancement, not distraction in a classroom. However, adequate training is crucial to advancing models of blended learning and even to providing a general awareness of the tools and approaches available to provide the groundwork to make it possible.

**Answering the Research Questions**

The central research question inquired about the experiences of faculty and administrators as digital education software and programs were being introduced into a traditional liberal arts institution. Interviewees, with exceptions, conveyed their desire to increase their use of educational software programs, beyond projecting slides on a screen. In interviewees’ responses, the challenge was identified as committing to maintaining the current technological infrastructure, and making it more robust. This was accompanied by a need to assure that technology would actually serve the liberal arts curriculum priorities and values. The commitment to technology incorporation was identified as a strategy in the college’s “2020” plan which outlined priorities to regularly conduct an assessment of the academic and business life of the institution regarding technology, as well as student use in this area.
**Subquestion 1.** The components of history and culture, and institutional practices, problems with dependable Wi-Fi in classrooms, which they identified as stemming from students using their devices to not only access academic materials, but texting, watching videos, and playing games on phones, tablets, and laptops, were considered by many faculty participants as serious distractions to learning focused on the traditional liberal arts approach. Some respondents were utilizing technology as much as the available campus internet service would allow, asserting they could indeed combine – and even enhance – the strong tenets of the liberal arts approach with applied technology. However, discrepancies were noted, as the IT participant, who worked across the board with faculty using a range of digital resources, described:

[The College] has been around a long time, has certain principles and technology, although it is becoming more and more prevalent on … campus, it still going to take a while because of where they've grown from. It's a liberal arts college, so you don't have the classes that would offer a lot of technology as well.

Thus, the tendency to continue the “sage on the stage” pedagogical delivery of materials, with a heavy focus on discussion, prevailed for at least half of the participants. Indeed, several individuals opted to use the minimal amount of technology needed to access email, and they chose to incorporate only a limited amount of even basic video and audio material into their instructional practices.

**Subquestion 2.** This question queried how faculty members described the level of technological competence they possessed to integrate new digital based teaching methods into the classroom. Interviewees admitted to varying degrees of abilities to use both hardware and software in the classroom. An interviewee addressed this question regarding a campus-wide instructional technology policy: “I would like to see the college be more proactive in that, as
opposed to eventually, someday, becoming reactive.” This need, as reiterated above regarding the lack of an instructional technology expert who could assist in retrofitting the tools to course content, emerged as one of the primary findings from the interviews. Openness to new ways of incorporating digital tools was not to any degree scarce; hesitancy persisted, however, because of both a lack of knowledge regarding what was possible, and guidance to realize versatile and appropriate implementation.

**Subquestion 3.** This question inquired about the challenges instructors and administrators faced regarding the integration of technology into the liberal arts setting. Interviewees consistently said they often looked to their peers to assist them in creating and operating programs in the classroom. The use of basic tools was also sometimes overdone: “The only impediment I can see sometimes I have in the past sometimes overused PowerPoints, and I find that students sometimes become somewhat zombie like in the classroom if there's too much PowerPoint use.” Finding technology assistance beyond the provision of online services and projectors was, at least on campus, informal, though faculty offered to teach programs as part of informal seminars. As an interviewee stated:

> I know that faculty who are very knowledgeable about it, they do share their knowledge in workshops and different faculty colloquiums and those things, but it’s usually optional and probably not enough of us have the time to do it. If it was built into faculty workshops and those things where we had to be there, then it would be more beneficial.”

**Subquestion 4.** This question discussed what types of resources, training, and institutional changes would be needed to support faculty wishing to implement or further enhance digital-based teaching in the classroom. Responding to this query, an interviewee who expressed interest in implementing digital educational technology said:
The college is always looking to upgrade the infrastructure, our technology infrastructure because demand is placed on it are constantly increasing. Yes, we recognize that if we were to add additional electronic tools, we would have to support them through our IT infrastructure.

Another interviewee responded similarly:

I think better faster Internet on campus is the main thing. We spend a lot of time waiting for things to load, unfortunately, or it feels like it is one of my frustrations. I'd like to see some more seminars and presentations about what my colleagues are doing, too.

Thus, stated yet again was the need for planned and integrated training in digital instruction design and application. This extended to the students who, while tech savvy, might not understand the full implications of living immersed in a digital world. In this sense, another commenter had misgivings about requiring online participation in the classroom without a thorough training program for students that included a discussion of ethics and privacy:

Maybe that's too hard of a word, but the ethics of having 18 to 22-year-olds ... mandating 18 or 22-year-olds to create a virtual presence and give themselves a virtual identity…to put out there to their world their thoughts about controversial issues, when they're so young. And in that sense, define themselves for years going forward.

Across the spectrum of faculty and administration, there was agreement that digital educational technology, whatever form it was to be presented, would increasingly be an integral part of the classroom landscape at the institution. A significant group of respondents said they believed that the internet accessibility issues on campus would be solved. Those faculty and staff who were utilizing online education programs and other forms of digital resources said they were confident that more and more courses would effectively combine digital interactivity and more traditional
student/instructor in-class exchanges as part of the curriculum. However, it was powerfully emphasized time and time again that training would be essential – on everything from physical use of hardware, to availability of software and information programs, to workshops on applications for both instructors and students, to a planned initiative from the institution to address through policy issues of privacy and ethics – so the technology was not simply imported for technology’s sake but as a tool that worked in service to the liberal arts purpose and paradigm.

**Summary.** While faculty and staff interviewees were overall satisfied with the operation of the campus internet system, a number were concerned that the infrastructure upon which the online system operate was not sufficiently robust to meet the needs not only of any increase in the use of interactive educational programs, but, given the increase in student and faculty personal device usage, to simply maintain the basic system that was in place. A majority of respondents said they thought digital educational programs would increasingly be used as components of instruction and course work in the near future, though the implementation level would rest on individual instructors’ visions of where, how, and with what frequency interactivity and device access play a role in their instruction model. Training and instruction on how to incorporate tools more effectively emerged as crucial, including the hiring of and support for a full-time instructional technology staff person.

**Conclusion**

Faculty and administration of the college that was the site of this study recognized and promoted the long history of a traditional liberal arts education. For more than 150 years at the time this study was conducted, the college had provided the lecture/discussion format typical of a liberal arts institution, and had been successful in attracting students and retaining faculty. Much
like the rise in the influence of the internet in the 1990s and the explosion of online content in the 21st Century, the college increasingly attracted a student body which mirrored the “connected” generation, students who expect immediate online access for their devices and, in a growing number of instances, look to instructors to provide interactive lesson plans, as well as digital learning tools similar to the ones they had been using in their K-12 experience.

Faculty interviewees interested in introducing or enhancing digital education programs expressed enthusiasm regarding the possibilities of interactive programs, which could enhance the lecture/discussion sections of their classes. That enthusiasm was tempered, however, with concern about their personal technical competence. Many, for example, had training in operating the basic tools such as the “Platform PC” in the front of the classroom, as well as the overhead projector and the connector for using a laptop for class materials and presenting them on the screen. They did not, however, have confidence in their competency to create their own interactive programs; they were also unsure of how to seek resources from colleagues more experienced in digital instructional design, even though several did. Given the number of digital programs that were being used individually within departments, many of the faculty interviewed looked to the administration to work with and engage those peers who were more internet savvy and content-knowledgeable to help bring the digital learning experience into more classes.

Unknown from the data collection, however, was whether or not a significant percentage of the faculty were prepared to move beyond a traditional liberal arts lecture/discussion/assignment format with basic use of technology for grading, assignments, and/or presentations, introducing a more complex and nuanced digital educational model. Interviewees expressed a range of opinions, from no interest in anything digital, opting for seminar style assigned readings and discussion, to faculty who were using digital formatted
programs and learning aids in every class session. While the administration had made iPad minis and other digital tools available, faculty pointed out there was not a concurrent training program; thus, unless a mini user was familiar with creating and presenting programs on screen and in conjunction with students who had minis, there was little value in a wholesale rollout of the iPad like the one that was promoted. Faculty who considered themselves digitally attuned and who offered commentary said they believed a greater interest in digital tools may have existed, but without consistent training and financial support for equipment and software upgrades, any large-scale, consistent digitization would be delayed, at best.

Faculty and administration respondents who favored digital education programs and software identified the value of interactive instructional materials in a classroom powered by high-speed internet service. These “digital natives” looked to the administration to support their initiatives by hiring of a formal instructional design specialist, someone who would be available to assist instructors in creating programs, as well as “teaching the teachers” to instruct others in the creation of their own programs.

The college was, as is the case with most liberal arts institutions in the first quarter of the 21st Century, attempting to maintain its traditional identity of offering small classes and a strong instructor-student bond, characteristics often more difficult to access at a larger institution. This smaller setting indeed was allowing instructors to work more closely with students in smaller classes, and it was giving students the opportunity to explore all types of learning opportunities. But students have been bringing additional types of digital tools, such as smartphones and tablets, in greater numbers to campus, especially in recent years.

In response to this increase, the campus Wi-Fi system at the time had been bolstered to meet the need for greater digital capacity. However, faculty members interviewed were
complaining about intermittent internet service in classrooms, including weak Wi-Fi signals, which caused persistent disruptions in digital class instruction. These respondents said they believed that, along with a campus wide instructional design and digital training program, there should be a re-dedication to significantly upgrading the internet infrastructure powering their devices and support for integrated use.
Chapter 5: Discussion of the Findings

Introduction

This study examined the impact of the introduction and implementation of digital educational software and tools in a traditional liberal arts setting at a small Midwestern college. In particular, the study examined the varying degrees to which faculty used (or did not use) interactive instructional programs and other digital tools, and the degree of interest administrators had in encouraging faculty to utilize technology in the classroom, as well as in addressing the cost of maintaining and upgrading the infrastructure. The researcher interviewed faculty respondents in-depth about their perceptions of student expectations for wider use of classroom technology in liberal arts teaching in the classroom and beyond, and queried them regarding how they envisioned, if at all, blending the longstanding tenets, principles, and practices of liberal arts with digital forms of applied instructional technology use.

This chapter begins by restating the research questions and sub-questions. It then presents a synthesis of the findings aligned to each question, followed by a discussion of the relationship of these findings to the literature and the theoretical framework. Next, the implications for theory and practice are discussed, followed by the conclusions. Finally, the chapter presents a post-analysis reflection of the findings, a statement of positionality, and clarification of limitations. It ends by indicating areas of inquiry researchers might explore in the future.

Topic Revisited

Employers, incoming college students, and often their parents are asking liberal arts colleges and universities to enhance their instructional programs to offer more technology to support learning for 21st Century professional advancement. Overall, liberal arts administrators and faculty interviewed for this study, in sync with previous scholarship, acknowledged that
movement towards more technological integration in the classroom would be inevitable, and that it behooved an institution like the one that was the focus of this study to be deliberate and intentional to achieve a blended approach, rather than technology for technology’s sake alone. Researchers have noted that liberal arts programs may be at risk of becoming increasingly obsolete, as students perceive their education and future job market needs are not being fully and comprehensively served with the traditional Socratic-based format (Prensky, 2001, p. 1). Incoming students arriving in a liberal arts setting have experience in elementary and secondary classrooms laden with technology, which may have been required as part of their coursework (Noguchi, 2017, p. 2). The dilemma lies in the fact that students seeking a liberal arts education were born after 1980, and are considered “digital natives” (Prensky, 2001, p. 1). These students regularly use digital tools, from smartphones to tablets, throughout their day, and expect them to some degree in the classroom; however, they also demand and see the value of the revered traditional liberal arts experience (lecture/discussion/assignment) with the problem-solving and critical thinking skills building it involves and that employers seek (Buzzard, et al, 2011, p. 131). Students surveyed by Engagement Labs eValue, the results of which were published in eCampus News (Bethke, 2016, p. 2), indicated that the institution they attend must “…place greater emphasis on their digital presence, engaging students with digital communications that are most in line with their preferences in order to boost enrollment.”

The propensity for tension to arise is significant as technology is added to traditional liberal arts learning programs. This is often because, as Mouasher and Lodge (2015, p. 274) noted, a myriad of technologies which are put into classroom service are not initially designed to harmonize with a diversity of pedagogical approaches. Technologies are not, as a rule, created with teaching and learning in mind; how pedagogy and learning activities are delivered often is
set in place by the type of delivery mode. Thus, the cart is not only put in front of the horse, but also in front of the driver. These dynamics were the focus of this study and shaped its findings.

Summary of Findings Related to the Central Research Question

Ultimately, this study sought to answer the following overarching central research question: What are the experiences of faculty members and administrators at a liberal arts college in the Midwestern region of the United States that hosts a variety of undergraduate majors as they negotiate the integration of technology/digital learning into traditional pedagogy, educational practices, and institutional structures?

Faculty members’ perspectives. Triangulation of survey, interview, and artifact document data showed that faculty recognized and acknowledged competency in their content area, as well as utilizing literature and support materials in their teaching; this was supported to varying degrees by levels of technological familiarity and use. Depending on the individual, their perceived level of technical competence tied to classroom use of digital educational material was diverse. Those who adhered more closely to the traditional liberal arts lecture-discussion approach to pedagogy, were, depending on the individual, generally open to experimenting with increased technological interactivity in their classrooms; however, several expressed that they were unsure of the value of at least some programs and initiatives that incorporated a strong degree of technological learning without a clear application to and enhancement of content. At least some faculty interviewees seemed content with their limited training and level of incorporating digital programs into their teaching; several had only a passing interest in creating specialized or digitally enhanced course work. Of the 12 faculty members interviewed, 11 had been implementing digital flash card for languages, on-screen real time photo and video editing, and interactive demonstrations in history and theology, when this study was conducted.
A percentage of the faculty, and at least some staff members interviewed for this dissertation, did not recognize such a demand for service or a comprehensive intent towards implementation in their academic universe. While a large percentage of faculty members interviewed were using some type of digital tool in their classrooms, but most of the participants expressed that they did not observe an organized effort coming from the administration to promote classes as “digital” or to inform future and current students of any regularity in instructors using digital education programs or interactive software as part of the curriculum. Tools varied from simply using an overhead projector and slides, to Blackboard quizzes, to digital flashcards, and to substantially digitally-driven lesson plans. One out of 12 faculty interviewees refused to use any technology in classes, or the bare minimum, and this individual asserted that the online capacity on campus was providing more entertainment than education for students, not to mention personal distractions which they perceived risked interfering with classroom participation and essential Socratic learning exchanges.

Administrators’ perspectives. Administrators interviewed for this thesis viewed the issues of digital education tools and their impact on a traditional liberal arts institution through specific lenses. An administrator heavily involved in the technological areas of the campus noted the continuing demand for high-speed internet that was increasing rapidly, but that participant also acknowledged the strong origins of the liberal arts tradition at the college. The expense of fail-safe infrastructure was a major concern, and implementation posed a significant challenge to this administrator, partly because, the interviewee observed, this drive for high speed internet and additional Wi-Fi equipment was, for the most part, student-driven. Purchasing and maintaining classroom equipment and investing resources in training and preparation for instructional purposes was a priority that competed with Wi-Fi expansion to enhance student use; this applied
to both the administrator and the department responsible for audio-visual equipment in classrooms and meeting areas across campus.

Another administrator viewed digital education software as a building block to maintain and enhance the image of the college as a traditional liberal arts institution with a strong and current technological capacity that responded to shifting and diversifying employer demands. This administrator was not formally in the classroom setting teaching at the time this study was conducted; therefore, their assessments of the value and applicability of classroom technology were based on the reception of feedback regarding classroom needs from other administrators and departmental heads more directly in contact with faculty and staff. The administrator acknowledged the demand for implementation of digital educational programs in college classrooms, but this individual chose to leave immediate decision making to the academic dean.

The third administrator was more directly involved in the daily classroom academic life of the college at the time of the interview and had a strong interest in applying technology to classroom settings. The administrator was responsible in large part for offering faculty the use of iPad Mini units to integrate into their instructional materials and approaches; however, the effort stalled due to an admitted lack of software training, applied technology preparation, and incompatibility with student PC computer use. Despite the setback, the administrator saw potential in instructor-initiated software and program use, including digital “flash cards” and expanded YouTube programming. The administrator was confident more digital education software would rapidly make its way into the traditional liberal arts setting and pointed to the college’s long term plan as a starting point for prioritizing this shift.
Discussion of Findings Aligned to the Research Sub-Questions

Faculty and administration respondents had experiences with their personal use of digital tools, minimally and otherwise. The experiences of faculty across disciplines were diverse, which posed challenges to technology staff and administrators attempting to establish priorities for implementation of digital expansion and instruction. Many faculty members had come to the college with a very limited level of computer expertise, years prior, and had acquired skills in a non-academic setting. Others were more akin to claiming status as “digital natives,” with technology a major part of their learning and teaching all their lives. Most, however, fell in the middle ground with varying levels of comfort with their own hardware and software tools, and, based on respondents’ comments, that comfort level often extended into their use of digital educational media and other instructional digital opportunities.

Subquestion 1: What are the components of the history, culture and institutional practices of a traditional liberal arts institution that either impede or facilitate the integration of technology into classroom teaching?

The internet infrastructure at the college remained an integral part of the success or failure when it came to utilizing any online programs in the classroom, even those that instructors perceived fit well with the institutional culture and value system. Faculty largely continued to embrace the inherent value of decades of non-technological teaching methods and practices fundamental to the liberal arts. While in some instances, the traditional lecture/discussion/homework/test/paper format was being transformed or replaced to some extent at the college, it remained a viable and primary method of pedagogy for seven of the 12 members of the faculty who were interviewed.
Faculty who desired to create online instruction, interactivity, or digital educational programming in any classroom were free to do so; the decision lay with individual faculty, and many opted to present extensive video and interactive material; others adhered only to simple Blackboard quizzes and attendance recording, or to basic audio-visual presentations. No rules or policies about implementation and usage existed; academic freedom in teaching approaches was a norm on campus. Repetitively, however, the faculty members pointed toward the need for policy development and a broadening of the options for implementation of digital teaching practices through hiring someone who had skills to teach the incorporation of what, for all practical purposes, actually constituted a blended learning approach, as evidenced fully by the interviews.

**Subquestion 2.** How do faculty members describe the level of technological competence they have to integrate new digital-based teaching methods into the classroom?

Aside from the small number of faculty who had no or sparse interest in technology in their classrooms, responders possessed a general confidence in the level of their personal technological abilities. Their issue was more about the extent to which those personal competencies could be transferred to classroom settings, and whether technological knowledge was sufficient to display and operate increasingly challenging tools and software without a campus-wide instructional technology initiative. Three of the 12 faculty interviewed stated that they believed it was time for the institution to hire a fulltime instructional design specialist to help faculty create and maintain interactive programs, instead of depending on volunteers, often peers, to help guide increased technological activity in classrooms.

**Subquestion 3.** What are the challenges instructors and administrators face regarding the integration of technology into the liberal arts classroom setting?
The biggest impediment continued to be what respondents described as the lack of a consistent and dependable internet service. Wi-Fi capacity or bandwidth was another pressing issue, as respondents noted that they were not able to consistently access and present interactive materials and videos due to the lack of robust Wi-Fi and issues with an intermittent internet connection. This was paralleled or closely followed by the need for assistance in learning digital pedagogical applications. Administration respondents pointed out that the institution had grown in size over the last decade, increasing demands on the scope of internet services needed on campus, as well as the demand for training in instructional technology. The staff in the IT department, administrators asserted, did indeed respond to technical issues when notified; however, they lacked the capacity to a considerable extent to help enthusiastic faculty members to bridge the technology-instructional divide. Few respondents expressed a need for more specialized equipment; rather, they stressed the importance of improvements focused on faster internet speed and accessibility coupled with instructional technology planning and training.

Subquestion 4. What kind of resources, training and institutional changes would be required to support faculty members in advancing digital-based teaching in their classes?

Faculty respondents interested in improving their digital skills asked for a dedicated instructional technology specialist who would be available to assist in creating programs, and in training them to utilize those programs in the classroom. Administration respondents recognized this interest from the faculty, but there had been no concrete movement toward formalizing the position, even in the planning stages, when this study was conducted. Faculty members were largely relying on volunteer assistance from peers, who stepped in to conduct in-service programs devoted to teaching how to create interactive and online content, or who tutored colleagues one-on-one. Other knowledgeable faculty created and moderated “breakout sessions”
on instructional technology and related workshop topics during faculty meetings held prior to the
start of fall and spring semesters.

Institutionally, the college remained a residential traditional liberal arts institution, as it
had been for nearly 160 years. An active core of five or six faculty and staff were using digital
educational coursework on a regular basis. Likewise, a core of faculty, consisting of primarily
older scholars, was choosing to have little to do with interactive coursework; one out of 15 total
interviewees had outright disdain for any computer-assisted coursework in the classroom. The
administration, as evidenced in their interview comments, was supportive of the addition or
enhancement of classroom technology and digital programs, which some faculty were choosing
to pursue.

Administration and faculty interviewees expressed the view that technological,
pedagogical, and content knowledge could readily be applied to the different components of a
liberal arts instructional model. Different faculty members were approaching the cultural,
operational, and interactional components of the practice of digital-based instruction to varying
degrees:

A constant in the consideration of applying an approach similar to TPACK to the
institution’s members’ usage pattern was a concern across the board that the internet
infrastructure was not adequate to have a dependable signal in the classroom to allow them to use
even basic computer programs, let alone interactive or video tools which require more Wi-Fi
bandwidth. Faculty and administration alike agreed that installing a more stable and robust
internet service was an important strategy; it was indeed outlined as a priority in the college’s
long-range planning documents, such as the college’s “2020” program. This working document
listed goals in the area of technology, including internet-based improvements and strategies to
make those goals a reality. Updated yearly, the document requested progress reports on the implementation of the goals and success of the strategies. An update produced early in 2014 indicated the college’s IT department had upgraded wireless access throughout campus in general and inside all campus buildings. Computers in the library and in the education department laboratories were also upgraded, with disaster and backup systems installed. Wireless printer stations were installed in a number of locations across campus. IT also upgraded older “platform PC” computer stations where needed. The utilization of tablets in classrooms on a larger-scale, however, remained a work in progress.

Faculty members and administrators alike, however, recognized that a higher-powered campus internet system could bring the unintended consequence of providing students with more online power and a greater chance of distraction outside of class (and, unfortunately, at times, during class). Respondents noted that easily available technology might need to be accompanied by outreach programs to students to address online overuse, which has been increasingly recognized as a problem in many arenas. The goal of such programs would be to involve students in directing that energy to the interactive programs in their classes and for other purposes rooted in academics and/or experiential learning or community work.

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

Faculty and administration at the college acknowledged the changing classroom dynamic of students expecting interactive programs and digital presentations, available on their smartphones and other devices, and the incorporation of digital tools and techniques into pedagogy. Alexander and Davis (2010) described a scenario where a combination of adherence to a liberal arts tradition which can create isolation and hinder digital education progress. Indeed, the authors observed that small liberal arts colleges cannot pursue.
…digital humanities projects due to their lack of centers and incompatibility of mission, and their inability to produce (digital humanities projects) further disables them from truly engaging with the field on both individual and institutional levels. Put another way, the definitional problem makes it more difficult to argue for resource allocation to efforts stakeholders cannot readily apprehend (p. 372).

Indeed, reflecting the “definitional problem,” faculty members varied in their enthusiasm about and their assessments of the value of using digital education tools. One of the 12 respondents refused to implement any online programs, and three limited their digital use to Blackboard programs, particularly Blackboard quizzes. The remaining eight respondents used technology in progressively active ways in their classrooms. The most active faculty member used digital flash cards as well as smartphone response tools. The underlying issue for the faculty exercising limited use, as Alexander and Davies (2010) described, was their comfort level in creating their own interactive programs, as well a lack of their more tech-savvy peers being willing or having the time to share knowledge with those who were curious about increasing use of such programs in their classes. This was exacerbated, as Mishra and Koehler (2006) noted, by a lack of systematic institutional support for technological implementation: “Social and institutional contexts are often unsupportive of teachers’ efforts to integrate technology use into their work. Teachers often have inadequate experience with using digital technologies for teaching and learning” (p. 1032). Indeed, 11 of 12 of the interviewees pointed out the absence of an instructional technology specialist on staff; training was largely contingent on the efforts of fellow faculty and staff, some who themselves were self-taught, who would offer occasional workshops or seminars throughout the college year. Again, as interviewees mentioned, there was
not a systematic digital tool training program in place, conducted by someone dedicated exclusively to that role and to providing ongoing support.

Mishra and Koehler (2006) emphasized that a lack of consistent training may place tech-hesitant instructors in a dilemma, imbued with a sense of inadequacy, because students and some of the courses they take were relying more on interactivity and connective access than in previous years:

Teachers will have to do more than simply learn to use currently available tools; they also will have to learn new techniques and skills as current technologies become obsolete.

This is a very different context from earlier conceptualizations of teacher knowledge, in which technologies were standardized and relatively stable. (p. 1023)

Respondents pointed out that recently hired faculty may have enhanced digital educational skills, but that they had discretion in applying those skills in their classroom, deciding to implement degrees of interactivity. Those respondents concurred that some technologies such as Power Point displays were used all over campus, and for some colleagues, this was sufficient enough of a use of technology as a teaching tool.

The issue of integrating technological knowledge with content and pedagogic knowledge intersects with and often contradicts the traditional liberal arts formation model. Seifert et al. (2008), citing a survey by Pascarella (2007), asserted that traditional liberal arts models of pedagogy did not necessarily enhance student outcomes to an extent greater than more technologically focused college learning programs, a factor that had not been rigorously tested at the college that was the site of this study:

Controlling for a host of demographic, precollege, and college characteristics, including a pretest on every outcome, attending a liberal arts college promoted the development of
some outcomes, inhibited the development of others, and largely had no significant effect on the development of many of the learning outcomes under examination. (p. 109)

Interviewees were asked specifically about technology in their classroom work, not directly about the intersectionality of liberal arts history and technological advancement; nonetheless, faculty and administration respondents acknowledged the technology growth in classrooms, and some were unclear regarding whether this technological boost was faculty driven, or as a part of the overall technology growth students demand, which IT was attempting to respond to with faster internet speeds and more robust Wi-Fi.

Of the 15 interviewees, administration and faculty alike, all were generously supportive of the traditional liberal arts “Socratic” method of teaching, which has defined the institution since its founding, including an emphasis on self-knowledge, self-expression, and “learning for learning’s sake.” However, the college had long attempted to straddle maintaining the liberal arts tradition while also remaining current with and integrating technological developments. Indeed, the college had launched computer courses and a computer major in fall 1983, keeping up with current trends at the time (Lumetta, 1983, p. 5). There were few computers in use on campus at the time, but, according to a college publication, 19 students enrolled for the major during the first round and, according to the faculty overseeing the course, students taking the courses combined their technological training with lively discussions of the moral and ethical issues surrounding computer science in general and on campus. This, according to the chair of the computer science department at the time, allowed students to “receive (their) training in an educational environment which places an emphasis on moral and ethical values” (Lumetta, p. 5). While the impact of social media and the concept of interactivity were years away, the college was up to date by introducing the framework for creating these tools, while remaining true to the
founding principles and by focusing discussions on the broader social, moral, and ethical implications.

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

The major tenets of the theoretical framework informing this study, Technological, Pedagogical and Content Knowledge (TPACK), emerged as underlying themes in the conversations with faculty and administration respondents discussing their experience in introducing digital educational programs in their classrooms. The following aspects of technological integration, which largely coincide with many of the directives outlined in TPACK, were in fact included in the college’s plan: (a) taking into consideration the cost of expanding and improving internet access on campus, (b) access to programs in all classrooms, (c) training for faculty and students in utilizing and launching different digital programs, and, ultimately, (d) the cultural implications of the incursion of these tools into a traditional liberal arts setting. Yet, apprehensions persisted, in line with a discussion by Porras-Hernandez and Salinas-Amescua (2013) regarding the tension that may arise in a traditional classroom setting as technology becomes more prevalent:

TPACK recognizes the relationship between the teacher’s technology integration decisions and context; however, the notion of context requires further theoretical development to understand its complexity, expand its several dimensions, and make the teacher’s own subjective variables visible as part of the TPACK model. The TPACK framework can also be used as framework in phenomenological approaches, such as teacher narratives, to uncover the teacher’s own knowledge construction following an inductive approach. (p. 224)
Further, as the authors noted, TPACK can be an effective framework to examine how teachers’ knowledge is constructed, based on reflection on the teachers’ ritual of listening to other teachers about their experience with technology and its impact on classroom content. This was revealed in the data analysis, which, as the authors Mishra and Koehler (2006) discussed, TPACK has the potential to resolve conflict between previous, more traditional learning environments and technology implementation. The authors have noted that technologies have their own requirements that may constrain classroom content, and taking into account the direction of instructional materials and other pedagogical decisions systematically is essential. Furthermore, they observed, it may not be appropriate to isolate technological knowledge from pedagogy and content knowledge, which was indeed a dynamic observed throughout this study.

Morsink et al. (2010), studying TPACK as an effective model for technology integration, noted that faculty may recognize the traditional liberal arts model may need modification, and that technology and digital products may assist liberal arts students in enhancing their learning – both critical thinking and more concrete marketable skills. The issue, echoed in the comments from various faculty of the college, was that there must be a commitment to create effective digital programs and tools that conversed with the tenets upheld by liberal arts; that commitment must also extend to having in place the most effective, appropriate, and efficient technology to present it. Respondents asked for more training and access to digital tools and hardware, as well as software programs, but stopped short of recommending a campus wide overhaul of classroom internet use or any large scale digital introduction, as TPACK advocates recommend. Morsink et al. (2010), however, were cognizant of the need for a “yellow light” approach to a large scale instructional design program until a significant number of faculty members feel comfortable with or express readiness to take on the challenge of expanding their course elements. Leaving room
for faculty desiring and thus intending to either utilize minimal online programs, or choose to remain free of digital programs in their coursework altogether, was found to also be necessary.

In this context, the interviews with faculty and administration alike generally revealed a resonance with the level of openness to exploration that the authors further codified as foundational to the kind of transformation that TPACK is intended to bring about. These included:

- Openness to the possibility that the content and procedures of yesterday might be improved tomorrow with the help of new technologies;
- Ongoing professional reflection and a commitment to identify areas for innovation and improvement;
- A willingness to apply new methods and strategies;
- A critical stance toward novelty and innovation for their own sake;
- A critical awareness that all technologies have affordances as well as constraints (Morisink et al., p. 4)

More specifically, the findings from this study revealed, for example, that faculty respondents who are using at least some types of technology as part of their class reported they were interested in improved hardware and infrastructure to help them more effectively present materials to students who are more “wired” than in recent years, which they deemed necessary.

As for “professional reflection and a commitment to identify areas for innovation and improvement,” those same respondents agreed that they should self-assess their competencies and seek assistance in creating interactivity in their courses, a strategy that would include seeking out literature and demonstrations of advanced internet-based learning programs (Morsink et al., p.4). At the same time, these faculty respondents cautioned that, when
considering online programs, “new” is not always better or more effective in the classroom, particularly when an innovation does not include supplemental materials to bolster the lessons being presented online.

Faculty and administration respondents uniformly acknowledged the campus-wide impact of technology in a liberal arts institution, and their commentaries aligned with questions from Balkun (2011) which generally, although indirectly, interrogate the value, efficacy, and practicality of implementing a strategy such as TPACK:

• Is the technology supporting learning or is it just a gimmick?
• How do we know the technology is improving learning?
• What ethical issues arise—intellectual property concerns, plagiarism, and so on?
• Does the technology result in active student engagement or passive observation of effects created by others?
• How do we address economic and other inequities that may impede access to the technology and to learning? (p.5)

Applying Balkun’s (2011) queries to the findings, interviewees differed in their views of how such questions might be answered, specifically whether technology led to active student engagement versus passivity in a classroom, and whether there was a direct line between technology and improved learning outcomes. There was awareness among faculty about obtaining proper credit and permissions to use online materials in presentations, as well as the need to be providing sufficient attribution on slides and other multi-media materials. As Chapter 4 revealed, respondents addressed the issue of available technology and financial and other equity concerns, noting much of the student population had at least a cellular phone, more likely a smartphone, and, with their coverage plan, could access course materials, and interact in the
class, without a laptop or tablet. Administration interviewees noted the introduction of iPads for interested faculty and students as one aspect that mitigated inequity, even though that program had been put aside for the foreseeable future.

**Implications for Practice**

This study has implications for faculty, administration, and staff at the college, as well as to some degree for students and parents. The study may also have implications for similar sized liberal arts colleges in the process of deciding to what extent they wish to expand their digital education “footprint” on their campuses, and the factors that will drive those decisions.

**Implications for faculty.** Faculty respondents reported varied applications of personal experience with using interactive software and/or computer hardware and software in their coursework. No mandate from the institution to use any technology in classes was in place at the time this study was conducted; additionally, to the best of the researchers’ knowledge, departments were not requiring their members to use any kind of digital program or hardware in their courses. Faculty members were, indeed, free to utilize any level of technology the infrastructure could support, or to refrain entirely from incorporating technology, even for grading purposes. Faculty members were also allowed to engage students in their classes with any number of interactive programs and lessons, or not. To the best of the researcher’s knowledge, faculty were also allowed to restrict the use of smartphones and other devices during class periods, but they could not require students to access pertinent information on those devices as part of class instruction and learning.

Faculty members were solicited to introduce iPads in their instructional programs; however, respondents noted that there was insufficient interest in implementation among those who were not currently Mac users, and the administration discontinued the iPad initiative.
Respondents also noted that there was little formal training in how to create and present class materials, and to guide students who were not already Mac users.

Faculty respondents sought assistance with creating and presenting their own lectures and interactive programs in their classes, usually informally from colleagues who were able to provide guidance. The respondents who wished to utilize digital tools to a greater degree were requesting that a full time staff position in instructional technology be created and funded, as this would provide a coordinated and uniform approach to using 21st Century technology and related pedagogy campus-wide. For example, about half of faculty respondents indicated they were active users of digital pedagogy resources, with interactive flash cards and other tools used regularly in the classroom. Others said they integrated digital educational technology to a lesser degree, with You Tube videos, interactive slide programs, and quizzes taken on students’ smartphones. While not unique, the researcher learned that this level of technical programming was an accomplishment for certain faculty across disciplines. A number of faculty at this level expressed that they were content to use Blackboard-based quizzes and journal posting sites as their level of technological interfacing. Indeed, this corresponded with Mishra and Koehler’s (2006) observations:

Teachers will have to do more than simply learn to use currently available tools; they also will have to learn new techniques and skills as current technologies become obsolete.

This is a very different context from earlier conceptualizations of teacher knowledge, in which technologies were standardized and relatively stable. (p. 1023).

What clearly emerges is the need for skilled personnel to train, direct, and support faculty through ongoing interventions with technology and digital instruction initiatives. This needs to be supported by adequate related infrastructure.
Implications for administrators. Administration respondents had differing opinions on the impact of digital technology in liberal arts class settings. Perspectives were largely based on the cost of upgrading the system, the attraction of a “wired campus” to prospective students and parents, and the value placed on increased online access by faculty and students as part of a return on investment.

Stances on these issues varied. The interviewee approaching the question from an academic viewpoint recognized the continuing desire by a majority of faculty to improve the speed and consistency of the internet service on campus to allow robust Wi-Fi access. Accomplishing this technical goal would allow those faculty members who wished to present interactive materials in their courses to have confidence they would have a successful and steady connection at class time. This viewpoint was shared by the technology interviewee, who also noted the availability and dependability of Wi-Fi on campus had improved. An issue for faculty, acknowledged by the interviewee, was the consistency and strength of the signal in classrooms to the level that it was strong enough to permit the use of smartphones and other devices, but instructors and their laptops often had to compete for a strong signal. The technical respondent did not offer an estimate of the cost of, nor a timeline to create, an infrastructure which would envelope the campus in an ultra-proficient internet signal.

The other administration respondent, someone not involved with day-to-day academic details, approached the internet access issue from a “current status” viewpoint, noting the entire campus had Wi-Fi and conventional internet service, and each classroom had a “podium PC” since the early 2000s. Additionally, the respondent noted that there were classes that might not lend themselves to digital interactivity, though this individual was also aware of the emergence of online summer courses, as well as “virtual” classes in at least one department. The interviewee
acknowledged the reality that most students were indeed “digital natives” and agreed that classroom technology would need to adapt to student expectations. In sum, as the administrators and faculty members revealed, any major technological launch in classrooms would need to be accompanied by a coordinated training program for faculty and most likely tutorials for students, with each constituency instructed in at least the basics of both finding classroom programs, and having cross-training for all involved. No matter the quality of the programs, faculty and administration respondents agreed that progress could not be achieved without an adequate internet infrastructure.

**Implications for students and parents.** Even though the interviews involved faculty and administration of the college, implications for students and parents can be outlined, given that the institution makes decisions on upgrading its internet service, the areas of the college where the internet improvements will be directed, and how the improvements will be financed – all which have an impact on these individuals. As mentioned by an administrator in the technical area, the Wi-Fi system had been expanded and bolstered considerably in the years prior to this study, largely in response to student demand. That individual said that students reported bringing as many as four devices to campus, driving the need for constant increases in internet capacity. Faculty independently decided whether or not to allow internet accessible devices in their classrooms and whether to incorporate them into instruction; there had been small steps taken towards actual interactivity and online integration in coursework. The majority of these implementations of digital learning were created and used by faculty desiring students to interact during presentations, or to share sourced material as part of a lecture. These activities were possible, though they were dependent on a clear and dependable Wi-Fi signal. To the best of the researcher’s knowledge, no systematic attempt had been undertaken to survey or query students’
and parent’s interest in the level of internet access in classrooms or the level of instructor use of
digital education software or tools. Such an endeavor would provide an opportunity to
proactively inform prospective students and their parents about instructors’ applications of
technology in their courses and to gauge the level of priority students actually place on this
approach to teaching.

**Implications for Small Liberal Arts Colleges**

With exceptions, small liberal arts colleges recognize that students are bringing
technology to the campus, expecting their institutions to provide high speed internet service, and
free Wi-Fi, with a consistent signal throughout the campus. Students, and their parents, may
expect classrooms to have a myriad of high-technology tools and digital-savvy instructors
presenting multi-media interactive study material; however, few systematic studies of parents
and students expectations of this related to a liberal arts environment are available.

The reality may be that cost, training, or internet infrastructure may reduce the
availability of classroom technology to the degree students may have used in high school.
Administrators, faculty and staff will face this conundrum if they have not already. For
institutions located in very remote areas, the lack of availability of high speed internet may be
more problematic. If these small colleges have not partnered with a local high school that may be
wired for high speed service, administrators may wish to pursue a partnership or cost-sharing, to
have such high-speed service available to all local education institutions. It is likely that students
and their parents consider high speed internet and Wi-Fi on a campus, no matter how small the
institution, as a requirement when they are conducting their college search.
**Implications for Future Research**

The study examined the implications of introducing digital education technology and software into a traditional liberal arts setting. This study further queried the interviewees as to the extent of their experience with interactive tools, and whether those devices and programs would be appropriate campus-wide. Responses from faculty ranged from no usage of any technology in class to multi-dimensional digital applications, including digital flash cards for language programs, interactive lessons accessed by students on their smartphones and tablets, to limited operation of online and distance learning programs. Administration respondents viewed the implications of digital access through different prisms: academic, technical, and operational.

The academic interviewee recognized faculty use of digital tools to varying degrees while acknowledging the limitations of internet access in classrooms and the varying degrees of interest in implementing software and technology in classes. The technology interviewee also acknowledged the inconsistent internet access on campus, as well as the competing demands for classroom internet availability and the large percentage of students, faculty, staff, and visitors using the college Wi-Fi system. The administration respondent also recognized the prevalence of students who expect instant high-speed internet access for the personal use, along with their academic access requirements. The cost of maintaining and improving a robust system is a part of the equation, and the administration interviewees noted the rising expense involved in supporting the internet infrastructure and digital instructional training.

Research into the topic of digital software and the liberal arts framework at the institution may branch out into a deeper examination of the application of the TPACK theoretical framework in the future as it applies to the motivation of instructors to expand their technological, pedagogical, and content knowledge. Research topics could also include the
implications of future technological specialist staffing to assure rapid and effective responses to what may become more complicated internet services and the demand for those services. Finally, future research could benefit from revisiting administration stances on hiring online course and educational technology specialists to assist faculty who create specialized course work, as well as adjunct programs to use in classroom presentations, something that was implemented informally at the time this study was conducted, usually self-taught by those comfortable enough to pursue those goals. Future research might focus on the intersections between “old” and “new,” exploring innovative ways that the traditional liberal arts teaching methods of lecture/discussion/assignment have been enhanced and enriched by technology use, outlining specific programs. Another area that could be of interest is the extent to which the traditional liberal arts model sans technological pedagogy is viable, given that many students come to campus after having had high school experiences that include high-speed, continuous online class activities and online studies in every course area. Additionally, research could address the possibility of creating a summer or mid-semester instructional technology “boot camp” – or other concentrated training experiences -- for college faculty interested in creating and presenting interactive class material, possibly in coordinated partnership for equipment and ongoing training with technological giants from the corporate sector. Future studies could also incorporate an examination of how K-12 institutions prepare students for college-level study, including an understanding of the extent to which they are or are not exposed to a traditional liberal arts instructional model, as opposed to a predominately technological learning setting.

Additionally, there is an opportunity to reach out to smaller liberal arts colleges which have successfully integrated digital educational technology and software into all aspects of their classrooms, and have created the position of educational technology specialist, someone who can
assist faculty in creating multi-media coursework, paired with multi-media instructional elements. Students attending these schools come to class equipped to access those video and audio elements, understanding those are a part of class work each day.

This inquiry would include determining the estimated costs for bolstering the campus online infrastructure, securing the salary of at least one instructional technology specialist, and providing an estimate for adding digital educational hardware to each classroom on campus, as well as the cost of licensing educational software. This inquiry could be launched through social media postings and email inquiries to regionally located liberal arts college and universities which have similar class sizes and a predominately in-residence student population.

Summary

The small liberal arts college featured in this descriptive case study remains strong in its century-and-a-half liberal arts tradition. The classrooms remain set in place for the lecture-discussion mode, and students who attend recognize the format, and some do attend specifically to receive this mode of instruction. At the time of this study, the explosion of personal technology had impacted the campus to a degree that college leaders may not have anticipated, but that they were addressing, both in personal online access and in classroom settings. Many instructors were introducing interactivity in their classroom settings, though a minority refused to implement any online teaching activity.

The opportunities for the college to expand and enhance its in-class online presence and digital educational approaches were primarily individually driven, though seminars and classes in instructional design and course content creation had been intermittently, and mostly informally, offered. For the foreseeable future, the researcher observed that this was the direction the college was heading – adapting to students’ online demands while attempting to meet similar
demands for a strong level of consistent and reliable online signals in classrooms all over campus, accompanied by training and support for the integration of digital pedagogy by instructors. Respondents, however, had varying views on the need to acquire additional training and expertise to create and present interactive programs in their classrooms. There was a range of levels of interest in introducing iPads in classrooms, accompanied by the concern from some respondents that students not attuned to Apple products would have to be “brought up to speed” to be able to participate with their personal iPad before any in-class digital sessions could be conducted.

**Limitations**

The study was conducted at a small private liberal arts institution, located a small city at least an hour’s drive from a major metropolitan area. The college population, both graduate and undergraduate, was about 2,000 in 2017. The experiences of the student body at this institution were markedly different than on a large college campus, thus limiting generalizability at that level; however, some lessons might be moderately transferable to institutions of similar size and character. According to published figures (Best Colleges, 2016), the student population at the time this study was conducted was about 54% female, 46% male, and the student/faculty ratio was 14:1. More than half the classes had 20 students or fewer. About 80% of the student body lived on campus, and roughly two-thirds of the students received some form of financial aid. The student population was predominantly Caucasian, which makes applicability of the study to more diverse settings challenging. Some foreign students were in residence on campus, and a very small percentage of local residents commuted to campus each day, which further limits drawing parallels to more multicultural and socio-economically diverse colleges. As a number of students brought cars to campus, there were opportunities for students to travel to neighboring
cities for events and activities; otherwise, they remained primarily on campus or in the immediate neighborhood. There were approximately 100 full- and part-time faculty members, including adjuncts and non-tenured members, a relatively small number, with many older faculty members. This indeed places additional limitations on the extent to which this group of faculty would be representative of other liberal arts setting. The ranks included new non-tenured faculty; however, an overwhelming number were tenured, and there were two emeriti when the research was conducted.
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Appendix A

Letters of Invitation to Participate

Dear President XXXX:

I am writing to let you know about an opportunity to participate in a discrete case study about the implications of digital education software and tools in a traditional liberal arts setting at a small private college. I am the Principal Investigator of this study. This study will consist of an anonymous, 30-45 minute interview session, recorded and preserved by the Investigator.

Your comments will be part of the larger interview group, including selected faculty.

Agreement to be contacted or a request for more information does not obligate you to participate in any study.

Please inform me of your availability yet this summer.

If you would like additional information about this study, please write me at:

throop.m@husky.neu.edu
816-509-4157

Thank you again for considering this research opportunity.

Michael Throop
Dear Dean XXXX:

I am writing to let you know about an opportunity to participate in a discrete case study about the implications of digital education software and tools in a traditional liberal arts setting at a small private college. I am the Principal Investigator of this study. This study will consist of an anonymous, 30-45 minute interview session, recorded and preserved by the Investigator.

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Thank you again for considering this research opportunity.

Michael Throop
Dear Director XXXXX:

I am writing to let you know about an opportunity to participate in a discrete case study about the implications of digital education software and tools in a traditional liberal arts setting at a small private college. I am the Principal Investigator of this study. This study will consist of an anonymous, 30-45 minute interview session, recorded and preserved by the Investigator.

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Please inform me of your availability yet this summer.

If you would like additional information about this study, please write me at:

throop.m@husky.neu.edu

816-509-4157

Thank you again for considering this research opportunity.

Michael Throop
Dear Faculty Member:

I am writing to let you know about an opportunity to participate in a discrete case study about the implications of digital education software and tools in a traditional liberal arts setting at a small private college. I am the Principal Investigator of this study. This study will consist of an anonymous, 30-45 minute interview session, recorded and preserved by the Investigator.

I have asked the Dean to allow me to send this mass email to faculty; I will choose, at random, 10-12 interview subjects, and arrange anonymous interviews with participants.

Agreement to be contacted or a request for more information does not obligate you to participate in any study.

If you would like additional information about this study, please write me at:

throop.m@husky.neu.edu
816-509-4157

Thank you again for considering this research opportunity.

Mike Throop
Appendix B

Letter of Informed Consent

XXXXXXX College
Michael Throop, M.P.A., CSM, Principal Investigator.

Protocol Information

Title: A Case Study Examining The Introduction of Digital Educational Tools in a Traditional Liberal Arts Education Program At A Small Private College

Informed Consent to Participate in a Research Study: I am inviting you to take part in a research study. This form will tell you about the study, but I will explain it to you first. You may ask me any questions that you have. When you have read this protocol, you may tell me if decide to participate or not. If you decide to participate, I will ask you to sign this statement and will give you a copy to keep.

Why am I being asked to take part in this research study? I am asking you to participate in this study because you are a faculty member, staff member, or part of the administration at this institution

Why is this research study being done?
This research will examine the challenges and opportunities presented to a small private traditional liberal arts college to implement digital educational software, while considering the cultural and technical issues that may hinder or benefit the introduction of these digital materials as part of a liberal arts curriculum.

What will I be asked to do? If you decide to take part in this study, I will ask you to take part in an interview session, which will be recorded. I will ask specific research questions concerning traditional liberal arts education and the inculcation of digital educational tools and software. I may ask additional questions, and seek your opinion on this topic. I may ask to have a follow-up meeting to ask additional questions.

Where will this take place and how much of my time will it take? You will be interviewed in your office, or in a mutually-agreed to neutral space on campus, at a time that is convenient for you. The interview should take about 30-45 minutes.

Will there be any risk or discomfort to me? As there will be no identification of any participant from the interviews, there should be no risk of harm from your response. All interviews will be anonymous.
Will I benefit by being in this research? You will receive no direct benefit for taking part in the interviews, but you will assist the College through this research.

Who will see the information about me? Your identity as a participant in this study will not be known except the principal investigator.

Procedures being used to protect personal information. The data card used in the audio recordings of interviews will be kept in a secure space, offsite from campus. It will remain in my possession and control through the entire interview and data collection process. The audio card will be destroyed at the end of the thesis project.

Describe any limits to confidentiality. As interviewees remain anonymous, and no one other than the interviewer and interviewee will know the responses to the questions, there is no threat to your confidentiality.

Can I stop my participation in this study? Your participation in this research is completely voluntary. You do not have to participate if you do not want to and you can refuse to answer any question. Even if you begin the study, you may quit at any time. Quitting will not incur a penalty against you.

Who can I contact if I have questions or problems? You may contact the Principal Investigator by phone at 816-509-4157, or at my office, 913-360-7391.

Who can I contact about my rights as a participant? If you have any questions about your rights in this research, you may contact Dr. Doug Brothers (dbrothers@benedictine.edu). You may call anonymously if you wish.

Will I be paid for my participation? You will receive a $10 gift card as soon as you complete the survey.

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

I agree to take part in this research.

____________________________________________  ________________________ Signature  
of person agreeing to take part  Date____________________________________________
Printed name of person above ____________________________________________

_____________________________________________ Printed name of person above
Signature of person who explained the study to the participant above and obtained consent

_____________________________________________ Printed name of person above
## Appendix C

### Survey Questions

<table>
<thead>
<tr>
<th>Research survey question</th>
<th>Text responses</th>
<th>Likert scale responses</th>
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<td>N = 5</td>
<td>N = 5</td>
</tr>
</tbody>
</table>

1. What is your title at the college? X
2. What is your department at the college? X
3. How many years have you worked at the college? X
4. To what degree do you value the incorporation of technology into your classroom? X
   Quite a bit = 1   Not at all = 5
5. To what degree do you perceive that students are more engaged using technology? (*) X
   Quite a bit = 1   Not at all = 5
6. To what degree do you think student learning is enhanced using technology? X
   Quite a bit = 1   Not at all = 5
7. What do you see as the benefits of incorporating digital tools into the classroom? X
8. What are some obstacles for introducing technology into your classroom? X
9. How did you learn to use technology? X
10. What supports/resources do you need or want as you incorporate technology into your classroom? X
11. Would you be willing to be interviewed at a later date? X
    Yes / No / Maybe
## Appendix D

### Survey Results

<table>
<thead>
<tr>
<th>Research survey question:</th>
<th>Text responses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is your title at the college?</td>
<td>4 Professors (*)</td>
</tr>
<tr>
<td>2. What is your department at the college?</td>
<td>5 Departments (**)</td>
</tr>
<tr>
<td>3. How many years have you worked at the college?</td>
<td>2 = 1 year; 1 = 4 years; 1 = 9 years; 1 = 18 years</td>
</tr>
<tr>
<td>4. What do you see as the benefits of incorporating digital tools into the classroom?</td>
<td>Learning flexibility; student engagement and remediation; greater student interaction with each other and material; variety of music in courses and saves prep time; only see negatives</td>
</tr>
<tr>
<td>5. What are some obstacles for introducing technology into your classroom?</td>
<td>Learning distraction; obsolete classroom technology; current lack of standardization of technology across campus; intermittent internet; no obstacles.</td>
</tr>
<tr>
<td>6. How did you learn to use technology?</td>
<td>2 = trial and error/self-taught; 2 = on-the-job; 1 = grad school</td>
</tr>
<tr>
<td>7. What supports/resources do you need or want as you incorporate technology into your classroom?</td>
<td>Educational technologist trained in instructional design, IT support, proper equipment, ability to sync textbook with blackboard; no needs</td>
</tr>
<tr>
<td>8. Would you be willing to be interviewed at a later date? Yes / No / Maybe</td>
<td>3 = Yes; 1 = No; 1 = Maybe</td>
</tr>
</tbody>
</table>

*Note.* (*) = Professor, Assistant Professor, Associate Professor, Adjunct Professor; (**) = Business; Journalism – Mass Communications; Modern, Foreign, and Classical Languages, Honors Program/Political Science; Music.
Appendix E

Interview Questions

<table>
<thead>
<tr>
<th>Administration interview questions</th>
<th>Faculty interview questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• I would like to ask you a series of questions regarding the issues of the inclusion of digital educational tools and software into the culture of a traditional liberal arts institution. Please describe the ways in which you believe greater inclusion of digital tools might enhance or inhibit the liberal arts teaching experience.</td>
<td>• I want to ask you about your experience with interactive learning or blended classroom technology at any institution prior to your joining the faculty of this college. If you have used digital tools, please discuss the positive and negative aspects of incorporating these tools into classroom instruction.</td>
</tr>
<tr>
<td></td>
<td>• (If the respondent has previous digital media experience) Please describe a lesson or course where digital educational tools integrated well with the learning objectives. How did you choose the types of digital programs presented during the course? From an institutional level, to what degree is your input sought in choosing these programs, and how they are utilized in the class?</td>
</tr>
<tr>
<td>• Can you describe your perspective regarding the degree to which digital tools should be incorporated into the traditional pedagogy of liberal arts? From your experience, has the introduction of these programs been left to the discretion of the department and/or an instructor, or has the college as a whole taken initiatives to encourage their introduction? What do you think the role of the administration of the college is regarding the implementation of digital learning?</td>
<td>(If the respondent has not had experience with digital media) Please take a moment, and describe a class you have taught or will teach where you would consider introducing an interactive digital technology program or lesson as part of your coursework.</td>
</tr>
<tr>
<td>• What role has the Board of Trustees played – if any – in encouraging or discouraging an enhanced incorporation of digital learning programs and tools into college life and classroom pedagogies?</td>
<td>• What concerns do you have about using digital educational media in your classroom setting?</td>
</tr>
<tr>
<td>• In initial contacts from prospective students, have you had any inquiries</td>
<td></td>
</tr>
</tbody>
</table>
Administration interview questions

as to the level of digital educational programs offered by the college? To what degree do you think the availability of such products is a deciding factor for students and their parents for choosing this institution?

- Can you please describe any communication and planning that has taken place between the administration and the IT department regarding the incorporation of digital technology into the classroom? Could you provide me with a history of any initiatives that have taken place in this area, and the extent to which budgetary funds have been dedicated to this?

- Are you presently considering any significant upgrades dedicated to digital technology? How do funding concerns enter into those decisions and what kind of funding might be available to support this? What input would you seek from faculty prior to pursuing this initiative?

Faculty interview questions

- This question concerns the liberal arts tradition that is the mission of this institution. Going forward, what is your perspective regarding the extent to which digital educational product inclusion in this setting should be a goal to be addressed college-wide? Please describe how this inclusion could be launched, incrementally.

- Based on experience, do you detect a serious objection to utilizing these tools by department colleagues? Has this been a topic of discussion in department meetings? Has your department invited digital users to present on this topic?

- Recognizing the extensive array of digital tools students bring to campus each year, what recommendations do you have for initiating and/or expanding digital technology in our classrooms? What would be a reasonable timeline to modernize the infrastructure? Do you think the technology currently in use on campus handle the digital capacity? Should it be a budgetary priority to pay for this technology and programming?
Internet Technology Director Questions

- In your experience interacting with faculty, what challenges have you observed as those faculty members attempt to integrate digital technology in their classrooms?
- In what ways is the college technology infrastructure prepared to integrate a greater percentage of digital education programs and software?
- Describe how IT staff interact with faculty and staff to incorporate software programs and, as needed, additional hardware that may be “layered” into the college technological system?
- What guidelines do you envision to integrate hardware and/or software in a classroom? What role might faculty play in this decision making?
- What factors, budgetary and otherwise, drive decisions on upgrading IT hardware on campus?
- How has the increase in personal digital devices in use on campus, by students, faculty, and staff, impacted the IT department’s ability to implement digital upgrades?
- How are campus expectations and IT reality about digital tools aligned?
- Please discuss the factors impacting decisions to purchase digital software and product access?
- Where do you see your department in terms of staffing, responsibilities, and launching digital initiatives in five years? Ten years?
- Is there anything else you would like to share?
### Appendix F

**Interview Coding Results**

<table>
<thead>
<tr>
<th>Coding taxonomy frequency</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure\educational technology\instructional technology</td>
<td>34</td>
<td>20.9%</td>
</tr>
<tr>
<td>Infrastructure\educational technology\software</td>
<td>26</td>
<td>16.0%</td>
</tr>
<tr>
<td>Infrastructure\hardware</td>
<td>16</td>
<td>9.8%</td>
</tr>
<tr>
<td>Student engagement</td>
<td>12</td>
<td>7.4%</td>
</tr>
<tr>
<td>Student resistance</td>
<td>12</td>
<td>7.4%</td>
</tr>
<tr>
<td>Faculty resistance</td>
<td>9</td>
<td>5.5%</td>
</tr>
<tr>
<td>Infrastructure\educational technology\Apple iPad program</td>
<td>8</td>
<td>4.9%</td>
</tr>
<tr>
<td>Infrastructure\educational technology\Apple Technology</td>
<td>7</td>
<td>4.3%</td>
</tr>
<tr>
<td>Infrastructure\educational technology\Liberal Arts</td>
<td>6</td>
<td>3.7%</td>
</tr>
<tr>
<td>Infrastructure\educational technology\classroom wireless access</td>
<td>5</td>
<td>3.0%</td>
</tr>
<tr>
<td>Infrastructure\educational technology\Liberal Arts\course content</td>
<td>4</td>
<td>2.4%</td>
</tr>
<tr>
<td>Classroom technology basics</td>
<td>3</td>
<td>1.8%</td>
</tr>
<tr>
<td>Faculty resistance\age of the faculty</td>
<td>3</td>
<td>1.8%</td>
</tr>
<tr>
<td>Faculty tech support</td>
<td>3</td>
<td>1.8%</td>
</tr>
<tr>
<td>Faculty tech support\customer demand</td>
<td>3</td>
<td>1.8%</td>
</tr>
<tr>
<td>Faculty tech support\classroom adaptive</td>
<td>3</td>
<td>1.8%</td>
</tr>
<tr>
<td>Infrastructure\educational technology\Liberal Arts\course content tech</td>
<td>3</td>
<td>1.8%</td>
</tr>
<tr>
<td>Faculty interaction</td>
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<td>1.2%</td>
</tr>
<tr>
<td>WordPress</td>
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<tr>
<td>Student engagement\textbook preference</td>
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<td>0.6%</td>
</tr>
<tr>
<td>Infrastructure\educational technology\slide displays</td>
<td>1</td>
<td>0.6%</td>
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<tr>
<td><strong>Sum</strong></td>
<td><strong>162</strong></td>
<td></td>
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