PERSPECTIVES FROM INFORMATION TECHNOLOGY LEADERS: REDUCING ACADEMIC COSTS IN SMALL, PRIVATE, LIBERAL ARTS COLLEGES IN NEW ENGLAND

A doctoral thesis presented

by

Kellie B. Campbell

to the

Graduate School of Education

In partial fulfillment of the requirements for the degree of

Doctor of Education

in the field of

Education

College of Professional Studies

Northeastern University

Boston, Massachusetts

December 2, 2018
Abstract

This study examined how Chief Information Officers (CIOs), also known as Information Technology leaders, understand the use of technology as a strategy for reducing academic costs in small, private, liberal arts colleges in New England. Semi-structured interviews were conducted with eight CIOs throughout small, private, liberal arts colleges in New England. Transcripts were analyzed using Interpretative Phenomenological Analysis (IPA) to identify themes. Four major themes emerged: the importance of positioning Information Technology (IT) within the college, the use of available data, the offering of alternative education models, and the opportunities around consortia and institutional partnerships. These findings were considered in light of the extant literature and Snowden and Boone’s Cynefin framework and suggest opportunities for: assessing the position of IT in an organization and how that supports strategy; building out a data strategy on a campus that prioritizes considerations of what to assess and measure; thinking through alternative delivery, such as online learning; and considering consortium and institutional partnerships.

Keywords: Chief Information Officer, Technology Leadership, Academic Costs, Cost Savings, Small Liberal Arts, Technology Strategy
# Table of Contents

Abstract........................................................................................................................................2

Chapter One: Introduction to the Study and Theoretical Framework............................................6

  Statement of the Problem.............................................................................................................7
  Significance of the Research Question.........................................................................................8
  Research Problem and Research Question................................................................................10
  Theoretical Framework...............................................................................................................12

Chapter Two: Literature Review................................................................................................21

Chapter Three: Research Design and Methodology.................................................................48

  Qualitative Research Approach................................................................................................49
  Participants................................................................................................................................52
  Procedures.................................................................................................................................53
  Criteria for Quality Qualitative Research................................................................................55

Chapter Four: Findings and Analysis........................................................................................61

Chapter Five: Discussion and Implications for Practice..........................................................97

References....................................................................................................................................120
Acknowledgements

A warm thank you to my advisor, Dr. Joseph W. McNabb. I appreciate you for your timely responses, always keeping me out of the weeds and moving my writing forward, and your constant encouragement that “Kel, you got this”. It truly meant a lot. I also want to thank Dr. Kimberly Nolan, my second reader. Finally, a thank you to Dr. Karen Popovich, for being my teacher, mentor and friend for so many years and for being my third reader on this work.
Dedication

There are so many people I would like to thank and dedicate this work to, including my friends and family who have supported me through this process - whether that be a phone call, a text, or a simple “how are you”. There is limited space to name you all, so I focus on my three. First, to my forever patient husband, for the past 12 years I have committed much of my time to pursuing higher education. I know that meant sacrificing time with you. Thank you for always being willing to take a back seat and sign your name on the dotted line for another student loan. Your support, encouragement, and patience is your love and I am forever grateful. To my Mom, you gave your everything to be sure I had it all. I am so proud of you and could never thank you enough for your courage and selflessness to make your life all about us. The opportunities and inspirations I have are because of you. You are my hero. Thank you for showing me what it means to be a strong woman and to lead with a kind heart. Finally, to my beautiful daughter - I hope you dream big. In fact, I hope you dream so big it scares you. I want nothing more than to show you that you are a capable, strong, and beautiful person. Keep your head high, push through every obstacle they put in front of you, bring others along with you, and don’t be afraid to ask for help. Always be a voice for the voiceless and always fight for what is right. I started this process when you were nine months old. When everyone asked why then, and why now, it is because of you. You have inspired me to be a better person and I want nothing more than to make you proud and let you know that there are no glass ceilings my sweet girl. And if you ever feel like you hit one, know you can smash through it every single time. I love you more than you will ever know. Dad, I hope I make you proud. xo.
Chapter One: Introduction to the Study

The aims of research in this particular doctoral program are to examine a complex problem of practice, generate knowledge from data gathered at the research site, and provide context and strategies for introducing and evaluating systemic change to help resolve or clarify that problem of practice.

In recent years, there has been increasing pressure on higher education to tackle challenges related to: increasing tuition costs and challenges around affordability and access, student debt, accountability and transparency, and considering the impact and opportunities that technology has on models of delivering an education. De Vise (2012) shows the 2008 recession has had tremendous impact on a family’s ability to send children to college and that student debt now exceeds credit card debt in the United States (U.S.). The U.S. Department of Education’s College Scorecard is providing new levels of transparency for students and families, encouraging a consumer market for “shopping” higher education. The College Scorecard is a tool for consumers to compare the cost and value of institutions through the lens of data such as cost, graduation rates, and employment rates. These increasing pressures are coming from students, parents, and political leaders - to name a few - and many of these pressures are encouraging leadership and staff and faculty at various levels of institutional arenas to engage in new and timely conversations. Specifically for the small, private, tuition-dependent, liberal arts college, some of the pressures include a never-ending pricing and discounting war, potential reliance on net tuition revenue as a key source for financial stability (depending on restrictions and depth of endowment), a battle for a diverse and full incoming class every year, and a direct threat from skeptics around the value of a liberal arts college. For colleges in New England, demographics are proving challenging, with many colleges going after the same students.
The purpose of this Interpretative Phenomenological study is to understand how Chief Information Officers (Information Technology leaders) make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges in New England. Knowledge generated is expected to inform a variety of leaders and stakeholders in higher education, with a specific beneficial lens for those in New England.

**Statement of the Problem**

From Bailey & Hussar (2013) and work published through the National Center for Education Statistics, by 2020 there are expected to be close to 10% fewer high school graduates in New England than there were in 2010, creating a threat and fierce competition for the potential pool of applicants that so many institutions recruit from. While finances can vary institution to institution, the cost of educating a student is a significant part of the financial pie. There are varying inputs into that process, allowing for a variety of solutions and approaches to addressing concerns noted above. Many are looking to innovations in the delivery of education, in relation to technology, as a potential solution and/or support in addressing challenges. With a direct threat to long-term existence, The Wall Street rating agency Moody’s, from Woodhouse (2015), predicts the number of four-year, nonprofit colleges closing annually would triple (from 5 to 15) in the next few years, while mergers would more than double (from 3 to 6). The role of Information Technology (IT) and IT leaders in these conversations is becoming more expansive, potentially offering strategic partnerships in innovating with the mission of educating. Smith & Cohon (2005) identified the unprecedented technological change that has been occurring for the last decade (plus) and the growing complexities. IT organizations are more than just infrastructure, the focus is now becoming more about leveraging infrastructure to support
strategy and mission. Therefore, this study seeks to better understand how technology can be integrated as a strategy for reducing academic costs through the lens of IT leaders.

**Significance of the Research Question**

The rationale for this study is the researcher’s interest in expanding research on how technology might be integrated as a strategy for reducing academic costs. Specifically, there is interest in answering that question through the lens of IT leaders, many times identified as Chief Information Officers. For years, technology has been identified, in many industries, as a tool for reducing costs/finding efficiencies. While not necessarily a new concept, specific to higher education, technology has been playing an increasing role in the recent conversations. We see this most clearly in the rapid expansion and role online learning is playing in the United States today. From the Online Learning Consortium (2016), there is a 263% increase over the last twelve years in online education. Today’s learners are dynamic, a mix of traditional and non-traditional, with 90% believing online education is comparative or better than traditional forms of education. New models of education, including blended and online, are growing at significant rates nationally. Recently noted, 77% of institutions offering online learning say it is a key solution to their long-term strategy. Many IT departments, and leaders, are being called to do more than just provide infrastructure and support – many are being called to support academic innovation, delivery, and to be partners in supporting institutional initiatives.

Challenges identified in the introduction present different pressures and opportunities for different sizes and types of colleges. While public schools and universities may be feeling some pain points through shrinking budgets, many non-profit, tuition-dependent colleges may be feeling it from enrollment decline and challenges and pressures in the game of tuition discounting. As previously mentioned, Woodhouse (2015) notes that Moody’s predicts the
number of four-year, non-profit colleges closing annually would triple (from 5 to 15) in the next few years, while mergers would more than double (from 3 to 6). Without thoughtful and significant research done on this topic, some institutions are at stake of closing. This encourages a sense of urgency, in terms of strategy and response. Faculty, of course, play a key role in the delivery of education, but recent literature seeks new ways in which we can deliver an education and consider cost and outcomes. Identified in literature below, an example such as a blended delivery could improve outcomes and save time (in some cases saving money).

Different than face-to-face instruction, blended learning environments combine both face-to-face experiences and traditional forms of instruction with online supplementation. An example from Trout & Vela (2016) summarizes data from 40 courses that were part of a redesign effort at California State University-Chico - focused on improving student learning, increasing efficiency, and reducing costs. There were improvements in student learning outcomes in over half of the courses that went through the redesign. Benefits included increased instructional efficiency, enhanced student learning, some cost savings with online instruction, and increase in course caps. There are other highlights through projects done in partnership with various organizations, including the National Center for Academic Transformation that signal redesigns and integration of technology as a way to improve learning outcomes and reduce costs. Other studies considering alternative delivery such as blended signal better results in student learning through identified outcomes in pre and post assessments (Demirer & Sahin, 2013).

Another example highlights an online platform, the Open Learning Initiative, designed through Carnegie Mellon and now transforming and being used at other institutions. As noted in Kaufman, Ryan, Thille, & Bier (2013), in a major study involving several Open Learning Initiative courses used in U.S. community colleges, students using the courseware covered 33%
more content in the same time as their peers in traditional courses *and* achieved a 13% learning gain, compared to 2% by peers in traditional, face-to-face courses.

Outside of redesigns, the technology itself and who is building it is quickly changing and expanding. Billions of dollars are being invested into higher education through technology start-ups. From Straumsheim (2015), we learn $2.51 billion was invested in educational-technology companies during the first half of 2015. Many are seeing the challenges facing higher education as opportunities to invest in change, with technology being considered a key way to do so. As noted above, the many pressures impacting higher education are forcing it to operate more like a business. Kasperkevic (2014) gives us the harsh truth: colleges are a business. Student loans are paying the bills. In many instances, from common business practice, we know disruption can sometimes come from an unexpected visitor.

Considering how Chief Information Officers make sense of integrating technology as a strategy for reducing costs provides a crucial lens to how some colleges may stay open moving forward. There are examples of studies done, but most tend to focus on the impact of the technology versus the vision of leaders. This study will seek to gather ideas from a variety of leaders and seek to identify themes and opportunities in addressing academic costs. If some of these can be considered through the lens of higher education, and not just location-specific institutions, we might be able to better understand and solve some of the greatest challenges facing small, private, tuition-dependent, higher education organizations right now.

**Research Problem and Research Question**

There is significant, increasing pressures on small, private, liberal arts colleges. This is clear through both the financial pressures and demographic challenges currently facing small, private colleges – with a direct threat to colleges in New England. At the same time, the value of
the liberal arts degree continues to be under scrutiny, adding a layer of complexity to how small, private, liberal arts colleges position themselves for students and families in today's world. Many of these pressures are encouraging leadership and staff and faculty at various levels of institutional arenas to engage in new and timely conversations.

The purpose of this qualitative study is to explore how Chief Information Officers make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges in New England.

**Central Research Question**

How do Chief Information Officers make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges in New England.

**Research Questions**

1. What do you see as challenges/opportunities facing small, private, liberal arts colleges?
   
   a. In New England?

2. How do you perceive your institution would define a *quality* education?

3. How do you perceive your current position/department is prioritized at your institution?

4. How do you perceive technology (as a strategy) is currently prioritized at your institution?

5. What groups of stakeholders are potentially responsible for integrating/prioritizing technology at your institution?

6. How would you personally define a *quality* education?

7. How do you prioritize your position/department at your institution?

8. How do you prioritize/make decisions around implementing technology solutions/strategies within your organization?
9. When making decisions in your organization, describe your thinking around cost.
   a. Expense and savings?

10. Tell me a time when you invested in a technology that you perceived might support reducing costs.
   a. Reducing academic costs?

11. What are your personal beliefs around the role of blended/online delivery and how it could/could not support the academic experience (sustain quality/reduce cost)?
   a. Same for learning analytics
   b. Same for adaptive learning
   c. Other technologies/strategies

The following section of this chapter will include a description and discussion of the Cynefin Framework, which will serve as the theoretical lens for this study.

**Theoretical Framework**

The Cynefin Framework is an innovative and non-sequential strategic decision-making model that draws on research from a variety of disciplines (Ahmed, Bwisa, Otieno & Karanja, 2014). It was developed by Kurtz & Snowden (2003) and brings an evolutionary perspective on complex systems characterized with uncertainty. Some of the varying disciplines the framework draws from includes complex adaptive systems theory and cognitive science through anthropology and evolutionary psychology (Ahmed, Bwisa, Otieno & Karanja, 2014). Kurtz & Snowden (2003) emphasize the framework is concerned with how people perceive and make sense of situations and how that impacts their decision making.

From Nichols (2005), the framework has a number of advantages, including it is a good fit with the kinds of decisions that strategic decision makers might face. In addition, it reflects
current management and organizational theory, thinking and practice. It also challenges some of the very basic assumptions, including thought that the world is in order and known and people are always rational.

To fully understand threads and the potential impact of the framework, one might look to better understand definitions around both strategic decision making and complexity science. Strategic decision-making stems from management science, and Elbanna & Child (2007) note the strategic decision-making process specifically deals with the process of making the strategic decision, implementation, and the factors that affect that process. According to Papadakis & Barwise (1998a, p.1), “Strategic Decision Making (SDM) is of great and growing importance because of five characteristics of strategic decisions: They are usually big, risky and hard to reverse having significant long-term effects, they are the bridge between deliberate and emerging strategy, they can be a major source of organizational learning, they play an important role in the development of individual managers and they cut across functions and academic disciplines”.

As outlined in Snowden & Boone (2007, p.3), advances in complexity science, combined with knowledge from the cognitive sciences, is transforming how leaders make decisions. Complexity is a way of looking at the world, and a complex system itself has the following characteristics: it involves large numbers of interacting elements; those interactions are nonlinear, and minor changes can result in major consequences; the system is dynamic, and the whole is greater than the sum of its parts; solutions cannot be imposed yet arise from circumstance; the system has a history and the past is integrated with its present and elements evolve with one another; evolution is irreversible; and the agents and the system constrain one another - making it almost impossible to predict or forecast.

The Cynefin Framework suggests four basic approaches in strategic decision making.
From Van Beurden, Kia, Zask, Dietrich, & Rose (2011), each domain has a different mode of community behavior, and each implies the need for a different form of management with a call for different leadership styles and tools, practices, and conceptual understandings. From Ahmed et al (2014), the summarizations of the four domains are as follows:

i) Simple (Known): Sense incoming data, categorize it in accordance with known schema, and respond with predetermined practices.

ii) Complicated (Knowable): Sense incoming data, analyze that data, and respond in accordance with expert advice or based on the analysis (respond to the out there).

iii) Complex: Probe to clarify patterns, sense the patterns, and respond by stabilizing desired patterns (manage the out there).

iv) Chaotic: Act quickly and decisively, sense reactions to that action, and respond further as appropriate (feel your way along).

In addition, there is a fifth context – disorder – that makes it difficult to recognize when one is in it. “Here, multiple perspectives jostle for prominence, factional leaders argue with one another, and cacophony rules. The way out of this realm is to break down the situation into constituent parts and assign each to one of the other four realms. Leaders can then make decisions and intervene in contextually appropriate ways” (Snowden & Boone, 2007, p.4). See Figure 1 for reference below.
To expand on the domains, the simple, or known domain, is referred to as the domain of best practice in Snowden & Boone (2007). The simple context requires straightforward management and monitoring. There are very clear cause and effect relationships and here leaders sense, categorize, and respond—“that is, they assess the facts of the situation, categorize them, and then base their response on established best practices” (Snowden & Boone, 2007, p. 2). Problems can arise in this domain if leaders incorrectly classify within this domain. If situations are oversimplified and only condensed information is assessed, regardless of the complexity, then leaders run risk.

The knowable, or complicated domain, is a domain that recognizes there might be more than one answer to the problem. From Snowden & Boone (2007), there is a clear connection between cause and effect, but not everyone recognizes it. A level of analyzing is added in this domain and reaching decisions in this domain can take some time. There can be a recognized trade-off between finding the right answer and simply making a call.
The complex domain recognizes that at least one right answer exists. This is an environment of many unknowns and situations and decisions can be complex given a variety of factors. From Snowden & Boone (2007), in this domain you can really only understand why something happened in retrospect. With that, patterns can start to emerge over time and leaders might be patient, instead of immediately responsive, to allow the best path to present itself.

In the chaotic domain, searching for the right answers is pointless. From Snowden & Boone (2007), searching for cause and effect relationships is impossible and no patterns exist. In this domain, leaders don’t seek patterns, but look to stop the bleeding – act and then establish order, transforming from chaos to complexity. In this context, there really is no time to ask for input. Some might suggest that true levels of innovation happen in this domain. Special interest should be given to the potential transition between the known and chaos domain. It can happen rapidly and it can have dramatic consequences. This might occur when a person or groups develop inflexible processes that erode innovative capacity over time (Van Beurden, Kia, Zask, Dietrich & Rose, 2011).

The research method used in this study will be an Interpretative Phenomenological Analysis (IPA) study. An IPA study centers on capturing the lived experience of participants through an analysis process in which the researcher's perceptions about the participant’s experiences are part of the reporting of the findings. The researcher is recognized within the research and the analytic process, and the researcher is trying to make sense of experiences and interpretations, informed by own beliefs. This approach moves beyond phenomenology (participants’ accounts) and attempts to report on the participant's experiences by considering the researcher’s own view of the world (researcher's interpretation).
The IPA approach truly seeks to understand the life-worlds of individuals in relation to phenomenon. It is selective, systemic, and requires a deep dive into understanding the individual – their lived experiences and how to make sense of them. In considering a theoretical framework, an initial focus was on strategic decision-making frameworks. Through the lens of strategic decision making, the Cynefin Framework provides a deeper consideration for the general research topic and then the research question. As outlined above, some of the current pressures on higher education are extremely dynamic and complex. How leaders make decisions within this environment requires a consideration of the complexity. It requires a consideration that the world is not always in order and the known is not always known. The research question, focused on how Chief Information Officers (Information Technology leaders) make sense of integrating technology as a strategy for reducing academic costs, will require a framework that recognizes a non-sequential process.

Critics of Your Theory

The Cynefin Framework was initiated by Snowden in 1999-2000, then at IBM global services as a way to manage intellectual capital and inform management process. Work continued with Kurtz, an IBM researcher, and grew to support policy making, product development, market creation, supply chain management, branding, and customer relations. The Bush Administration, and various arms of government have applied it over the years, and it has also been used throughout the healthcare industry as well. From Derindere (2014), it has also most recently been applied to Information Systems, considering it a suitable tool of sense making for decision makers. From Ali (2014), the framework was designed to help in understanding formal and informal communities and interactions of structured processes and uncertain conditions. Some critics of the framework suggest that it can be difficult and confusing and needs a more rigorous foundation. The risk with
the model is that it might be referenced as just another 2x2 model without a solid understanding of its intended application. From Hasan & Kazlauskas (2009), to avoid this, readers are encouraged to employ a Cynefin ‘sense-making’ approach when considering new projects or reviewing existing ones. What this might look like is a team meeting using the framework as a basis for reflection, or a workshop with a trained facilitator. Full benefits and limitations may only be realized over time, specific to the industry and the ongoing context of its application.

In addition, some feel that it covers too limited a selection of all of the possible contexts (Firestone & McElroy, 2011). With that, the framework supports the use of both space (diversity) and time (change) to understand the perspectives of different stakeholders. Contexts that can be regarded in the use of this framework can be considered wicked, meaning problems that are ill-defined, several conflicting criteria for solution definition, solutions which create further problems, and no obvious indications of when enough has been achieved (Rittel & Webber, 1973). Some source that the titles of the domains, noted above as known, knowable, complex and chaos, are a bit too ambiguous as well. The framework itself suggests that the titles really fall into two categories, both ordered (knowable and known) and unordered (complex and chaos).

**Rationale**

As previously mentioned, the research method is an Interpretative Phenomenological Analysis (IPA) study. The IPA approach truly seeks to understand the life-worlds of individuals in relation to phenomenon. It is selective, systemic and requires a deep dive into understanding the individual – their lived experiences and how to make sense of them. With that, the research participants will be individual technology leaders, and this research will work towards identifying themes in how they make sense of integrating technology as a strategy for reducing academic costs. The individuals themselves all work within different institutions, meaning the
environments and platforms from which they share stories will all vary. Through the lens of strategic decision making, and specifically the Cynefin Framework, there is a commitment and understanding to the complexity of those environments and how that might impact the thoughts, decisions, and stories of each individual.

In referencing the reasons strategic decision-making is of growing importance, Papadakis & Barwise (1998a) notes that decisions in this frame are usually big, risky, and hard to reverse having significant long-term effects. They are the bridge between deliberate and emerging strategy, they can be a major source of organizational learning, they play an important role in the development of individual managers, and they cut across functions and academic disciplines. If we consider this study specifically through an academic lens, important to highlight two specific qualities mentioned above including organizational learning, and how these decisions play important roles in the development of individual leaders as members of an academic institution. In addition, it reflects current management and organizational theory, thinking, and practice. It challenges some of the very basic assumptions, including the thought that the world is in order and known and that people are always rational. Finally, the framework itself recognizes a state of innovation. As previously mentioned, some look to the chaotic domain as a state of innovation. This framework allows for a variety of perspectives, opinions and stories that support simple and predictable leadership and chaotic leadership that involves no true application or one solution.

**Applying theory to your study**

The Cynefin Framework can provide different views on an issue, to make sense of diverse problems by positioning them in appropriate domains, and then identify suitable methods for dealing with those problems and challenges (Van Beurden et al, 2011). The framework can
also be used as a way to understand how issues and problems evolve over time – either on their own or through deliberate planning. A common trajectory is to work through the model clockwise (chaos to known).

The most basic application of the framework is as a tool for categorizing issues and strategies (Van Beurden et al, 2011). Categorizing issues can be helpful, but it is essentially static. When we consider the use of a sense-making process, such as the Cynefin Framework, it helps to better understand that the systems we are engaged in are perpetually in flux. In addition, Snowden (2002) views sense-making as a social process, meaning one must make sense of the world so they can act in it. The model itself will allow me to examine transitions between the domains, key to understanding changes that can facilitate this work. Ideas, decisions and others can shift between the boundaries and domains as contexts change. This will be especially helpful considering participants work in extremely different environments with different systems all having influence.

The framework also encourages an extended approach for understanding settings and communities. Examples might include governance structures, decision making processes, network patterns and collaboration models (Van Beurden et al, 2011). It acknowledges and incorporates diversity, change, and continuing evolution.

**Conclusion**

A deep understanding of context, the ability to embrace complexity and paradox, and a willingness to flexibly change leadership style will be required for leaders who want to make things happen in a time of increasing uncertainty (Snowden & Boone, 2007). Dealing with change requires new tools of understanding. Snowden (2002) makes a point of strongly resisting the existence of a single or idealistic model for this type of work. Rather, the key to survival and
growth is recognized as coming from the ability to adapt to change through diversity and approach. To conclude chapter one, considering this research through the life worlds of Chief Information Officers (Information Technology leaders), and how they make sense of integrating technology as a strategy for reducing academics costs, provides a crucial lens to how some colleges potentially stay open moving forward. Through initial research, and a general review of the problem of practice, it is clear that the pressures and opportunities facing higher education are dynamic and complex. A framework such as the Cynefin Framework will be able to support the complexities of this research and will allow for flexibility with both space (diversity) and time (change) to understand the many perspectives of different stakeholders. Chapter two presents a review of literature that considers many of the threads discussed above. The literature review provides an overview of small, private colleges and financials, demographics, and the challenged “value” of the liberal arts degree; an important focus and depth of review related to technology, given the major impact it is currently having on education and the challenges and opportunities it presents related to the research question; a focus on key stakeholders, including students, faculty and the role of technology leadership; and finally, an overview of terms and perspectives around productivity, efficiency, and cost.

Chapter Two: Literature Review

In recent years, there has been increasing pressure on higher education to tackle challenges related to: increasing tuition costs and challenges around affordability and access, student debt, accountability and transparency, and considering the impact and opportunities that technology has and can have on models of delivering an education. These increasing pressures are coming from students, parents, and political leaders - to name a few - and many of these pressures are encouraging leadership, staff, and faculty at various levels of institutional arenas to
engage in new and timely conversations. Specifically, for small, private, tuition-dependent, liberal arts colleges, some of the specific pressures include a never-ending pricing and discounting war, potential reliance on net tuition revenue as a key source for financial stability (depending on restrictions and depth of endowment), a battle for a diverse and full incoming class every year, and a direct threat from skeptics around the value of a liberal arts degree. Many are looking to innovations in the delivery of education, in relation to technology, as a potential solution and/or support in addressing challenges. With a direct threat to long-term existence, The Wall Street rating agency Moody’s, from Woodhouse (2015), predicts that the number of four-year, nonprofit colleges closing annually would triple (from 5 to 15) in the next few years, while mergers would more than double (from 3 to 6).

The role of Information Technology (IT) and IT leaders in these conversations is becoming more expansive, potentially offering strategic partnerships in discussions around the academic experience. Smith & Cohon (2005) identified the unprecedented technological change that has been occurring for the last decade (plus) and the growing complexities. IT organizations are more than just infrastructure. The focus is now becoming more about leveraging infrastructure to support strategy and mission. Considering how Chief Information Officers (CIOs), also known as IT leaders, make sense of integrating technology as a strategy for reducing costs provides a crucial lens to how some colleges may stay open moving forward. There are examples of studies done, but most tend to focus on the impact of the technology versus the vision of leaders. This Literature Review will seek to cover a variety of topics related to the research question, including an overview of small, private colleges and financials, demographics, and the challenged “value” of the liberal arts degree. An important focus and depth of review is given to technology, given the major impact it is currently having on
education and the challenges and opportunities it presents related to the research question. There is also a focus on key stakeholders, including students, faculty, and the role of technology leadership. Finally, there is an overview of terms and perspectives around productivity, efficiency, and cost.

The Small, Private, Liberal Arts College

Some of the specific pressures facing the small, private, tuition-dependent, liberal arts college include a never-ending pricing and discounting war, potential reliance on net tuition revenue as a key source for financial stability (depending on restrictions and depth of endowment), a battle for a diverse and full incoming class every year, and a direct threat from skeptics around the value of a liberal arts degree. Specific to colleges in New England, demographics are proving challenging, with many colleges recruiting the same students. This section will cover pricing and discounting with net tuition revenue as a key metric to fiscal health, demographics, and the battle for the same students, as well as the ongoing debate around the value of a liberal arts degree.

Financial Stability: Net tuition revenue

For private colleges, heightened competition, increasing costs, and declining real student financial aid provided by the government are major factors impacting financial changes over the past 10-20 years. These pressures have a direct impact on how private colleges price their services. Tuition has risen rapidly, with even more rapid increases in institutional financial aid (discounting) as it is being directed towards strategic enrollment management efforts (Summers, 2004). Since the 2008 recession, many institutions have realized significant impact and pressures on overall revenue sources. Major revenue sources for private colleges tend to come from net tuition income, endowment income, and gift income (Dorantes & Low, 2016). Net
tuition revenue is defined as gross tuition and fee revenue less institutional financial aid that is financed from both the colleges’ endowed and non-endowed (i.e. tuition) sources (Summers, 2004). Financial stability for many small, private colleges mainly comes in the form of net tuition revenue, meaning student enrollment and attendance is crucial for financial health. With shifting demographics, the battle for the same students is increasing and many institutions are finding themselves in a discounting war to attract the most students possible.

**Demographics - battle for the same students**

Major demographic shifts nationally are providing opportunities for some colleges and challenges for others. Specifically, for New England, from Bailey & Hussar (2013) and work published through the National Center for Education Statistics, by 2020 there are expected to be close to 10% fewer high school graduates in New England than there were in 2010. This trend has created a threat and fierce competition for the potential pool of applicants that so many recruit from. Many institutions have reported a decrease in applications and many recognize the challenges in marketing to larger geographic areas, including marketing costs. Data from Harney (2011) – as part of the New England Board of Higher Education analysis of U.S. Department of Education data - since 2010, enrollment has slowed down in New England colleges. There is also a major shift in racial diversity happening across the country which is important to recognize. Sourced from the Ennis, Ríos-Vargas & Albert (2011), from the United States Census Bureau, the total number of people under age 18 rose by nearly two million over the decade. With that, the number of white children fell, while the number of Hispanic children rose sharply. During the last decade, Texas alone added 979,000 individuals under age 18, of which 931,000 were Hispanic. Over half of the Hispanic population lives in just three states: California, Texas, and Florida. This data suggests growth is happening far from New England, a
location heavily populated by private colleges. The impact of this has become a direct threat to long-term existence of some of these institutions, with The Wall Street rating agency Moody’s predicts that the number of four-year, nonprofit colleges closing annually would triple (from 5 to 15) in the next few years, while mergers would more than double (from 3 to 6) (Woodhouse, 2015).

**Value of the liberal arts college**

It is nothing new for the liberal arts college to face scrutiny in the eyes of many. In a 1971 article entitled “The Death of the Liberal Arts College,” historian James Axtell (1971) cites an obituary written for the American liberal arts college. Among the signs of decline identified in the obituary were an inability to meet the nation’s demand for a “larger, more expert citizenry” (p. 339) and a failure to shed its “aristocratic origins” (p. 339). For some time, many external pressures have impacted perceptions and values. The role of technology has become a major focus. The most serious threats are the battles of ideology and the shifts in technology (Neely, 1999). We live in a market-driven world, with market forces impacting the role of higher education and the types of students that are going out into the work force. Major external factors include the demographic, economic, and geographic shifts (as mentioned earlier), but market economics are driving specific, job ready outcomes. Ragan & McMillan (1989) also suggest the pressures that have been challenging the liberal arts for some time. Directly outlined are rising costs, increasing vocationalism, decreasing funds, and fewer students in the 18-22-year-old market.

At the same time, in a changing and complex world, it is not uncommon to see many highlighting the value of a liberal arts college. From Dix (2016), dedicated to the free and open pursuit of knowledge for its own sake, a liberal arts education provides a multi-faceted view of
the world. It enables students to see beyond one perspective, encouraging them to understand others even if they don't agree. It instructs us to base our opinions on reason, not emotion. Although not a panacea, it can help individuals on every side of a debate have productive conversations leading to, if not agreement, at least détente. Logan & Curry (2015) emphasize the debate about the effectiveness of the liberal arts curriculum is centuries old and that recent financial and social pressures have placed the survival of the liberal arts in the United States at even greater risk. With that, “the place of curricular breadth in liberal education is ultimately a matter of wholeness. For American institutions, it is a key ingredient, along with depth, in preparing a fully educated citizenry capable of thinking critically, troubleshooting creatively, and communicating effectively” (Logan & Curry, 2015, p. 68).

A report on “How Liberal Arts and Sciences Majors Fare in Employment” published by the Association of American Colleges & Universities (AAC&U, 2014) indicates 80% of employers believe all students should acquire broad, liberal arts-based knowledge. In addition, 93% believe that the abilities generally associated with a broad education, such as critical thinking and communication skills, are more important than a student’s undergraduate major. Echoing the need for balance, a majority of employers recommend breadth and depth of knowledge and skills, as opposed to only one or the other, for recent graduates who hope to succeed in their companies (AAC&U, 2014).

Conclusion

There is a strong case made that there are significant, increasing pressures on small, private, liberal arts colleges. This is clear through both the financial pressures and demographic challenges currently facing small, private colleges – with a direct threat to colleges in New England. Student enrollment has a direct impact on the financial health of an institution. At the
same time, the value of the liberal arts degree continues to be under scrutiny, adding a layer of complexity to how small, private, liberal arts colleges position themselves for students and families in today’s world. There is a strong defense for the value of a liberal arts degree, but when mixed with other noted pressures, one cannot look through just one lens to find solutions to communicate opportunities and potential value.

**Trends in Technology**

Technology has had a historical and proven impact on many industries, but the impact on higher education continues to expand rapidly. There is considerable literature around the expansion of blended and online learning, but it is crucial to consider that in the context of small colleges. Learning analytics, adaptive technologies, and expanding digital materials are also influencing education. All are important in how they support rapid expansion of alternative delivery/experience and present significant challenges and opportunities around academic delivery. This thread considers those trends in detail.

**Expansion of blended and online learning**

The Online Learning Consortium (2016), referenced as OLC, is an organization made up of hundreds of institutions and corporations, in over fourteen countries, dedicated toward advancing best practices in online learning. In a recent infographic released by the organization, there is a documented 263% increase in online education over the last twelve years. Today’s learners are dynamic, a mix of traditional and non-traditional, with 90% believing online education is comparative or better than traditional forms of education. New models of education, including blended and online, are growing at significant rates nationally. Recently noted, 77% of institutions offering online learning say it is a key solution to their long-term strategy. For students, universities often charge less for online courses, seeking to address the student debt
now exceeds credit card debt in this country. Finally, it is predicted by fall of 2018, 48% of teaching materials will be digital, supporting a blended and/or online delivery.

With that data in mind, one must understand where the challenges are in this mode of delivery. Ying-Hsiu & Tourtellot (2011) state that implementing blended, accelerated learning programs (or courses) requires a systematic approach, not just the addition of new technologies. Adding an additional function requires additional resources, time, and strategy. Small colleges face challenges with a movement towards blended learning because of already-constrained resources. From OLC, 85% of faculty report having little experience teaching with digital learning materials. Simpson (2010) considers this through rewards for faculty. As these new mediums become strategy and mission for an institution, without significant rewards and governance, recruiting and sustaining quality faculty might prove challenging. Significant faculty development, as well, must be considered and investments must be made to assure quality. Finally, for smaller colleges moving into this environment, Banerjee (2011) considers student satisfaction (specifically with blended learning), stating it depends largely on “challenges presented by the subject matter, the degree to which self-directed learning and problem solving are required, and the effectiveness of chosen pedagogies by which face-to-face and online methods are combined” (p.8).

**Learning Analytics**

As suggested by Clow (2013), learning analytics is the analysis and representation of data about learners. This data can be information such as historic grades, performance, Grade Point Average (GPA), and demographics for example. It can come from a variety of sources, including common platforms used in alternative delivery (blended and online), such as a learning management system. The reason for using this data is that it can be used to improve learning,
providing teachers with a new way to view both students and educational models. With use of this information, the goal is faculty can both improve their teaching and provide better student outcomes. Several institutions have been developing frameworks and models to test the use of learning analytics in the educational setting.

In distance learning courses, predictive analytics are also being used to “generate a model of the probabilities of success and retention at different points, or milestones, in a student journey” (Calvert, 2014, p.160). The benefit of using analytics in this model is to help keep students engaged, preventing the potential of students leaving (given the online atmosphere of the course where faculty and students do not see one another frequently). The use of analytics can help personalize and tailor courses to individual students, improving retention (and assuring revenue) in online courses.

Through expanded research in this area, more proposed approaches and models for educators surface - specifically to support online teaching and pedagogy. An example is presented in Cheng-Huang, I-Chuan, Su-Chun, & Yea-Ru (2015), which considers a model to provide the best balance of cognitive load that is conducive to learning. Data from a learning management system, along with a social media footprint, can allow for instructors to adjust their pedagogy in online environments as needed to support student learning. It is apparent that not only will the tools that are available to instructors be impactful, but others in the field can adopt models that can be shared.

Concepts such as data mining and predictive modeling consider the idea that all of the data that is “mined” about students can be used to predict student outcomes and success. It also supports immediate feedback and allows for constantly updated information about student’s progress, allowing for just-in-time intervention. An example of this is shared in a study from a
robotics course where thirteen students were monitored by a faculty member, using data about students to create decision trees. “Effective use of educational robotics requires a learning environment, which supplies open and flexible support mechanisms for the members of a learning community” (Jormanainen & Sutinen, 2014, p. 294). As shared in Jormanainen & Sutinen (2014), through this study, it was concluded that data mining, and decision trees in particular, are effective for classifying students’ progress in the educational robotics setting, and the open data-mining process produces useful and interpretable information about the students’ progress with relatively small datasets. This study blends the role of both teacher and software, and application proves to have a positive impact on student outcomes.

A comparative study, noted at Purdue, focused on predictive modeling with previous data that considered demographics, previous academic history, interaction, and performance to date. The predictions from this data/model “translated into a signal: green, denoting a high chance of success; yellow, denoting potential problems; or red, denoting a high chance of failure” (Clow, 2013, p.687). Students in this study saw a 10% point-increase.

While some institutions are applying this work at an individual course level, some institutions are applying this on a larger scale, such as through an introduction series of courses. An example of this was at the University of Michigan, where predictive analytics were used in a large gateway physics course. They worked to predict performance based on historical data, including GPA. Through this effort, they developed intervention mediums, including the development of “E2Coach (an Expert Electronic Coach), a computer-tailored student support system for gateway STEM courses” (Wright, McKay, Hershock, Miller, & Tritz, 2014, p.29). Initial data from this study suggested students performed better with this intervention. In 2013, this resource was extended to 8,000 students, showing the application of learning analytics at a
It is important to consider the use of learning analytics at an institutional level. Learning analytics can offer higher education valuable insight into their people, informing high-level decision making to support strategic planning and the prioritized use of resources. At the University of British Columbia, Vancouver, they used an analytics platform to provide information about the use of their learning management system (LMS). Data was provided about the use of the LMS, informing a strategic plan that was “dominated by technical concerns and made little use of the intelligence revealed” (Macfadyen & Dawson, 2012, p.149). After experiencing this and considering theories of change management and resistance to innovation, the authors argue that “to have meaningful impact, learning analytics proponents must also delve into the socio-technical sphere to ensure that learning analytics data are presented to those involved in strategic institutional planning in ways that have the power to motivate organizational adoption and cultural change” (Macfadyen & Dawson, 2012, p.149).

One of the concerns recognized in the use of learning analytics is around ethics and the use of data. As noted in Greller & Drachsler (2012), while there is enthusiasm about the use of learning analytics in education, there are also questions for further research. Along with the quality of data, there are also concerns around softer issues, including ownership and ethical use and dangers of abuse, or exploitation of and around data. There is also demand for competencies that help interpret and act on learning analytics results. It is clear through some of this research that the application from learning analytics, as well as the consequences, are still far from understood.
Adaptive and Personalized Learning

Adaptive learning is another growing trend, where technology-enabled feedback strives to improve student learning. It is the hope this feedback both engages students in their work and allows for technical intervention that supports action on future learning. Like learning analytics, adaptive learning is fairly new in higher education, with similar concerns and opportunities. The idea is that the use of this adaptive and online technology allows for personalized instruction and new ways of delivering an education that can have a variety of impacts on an institution.

Engagement in education can be a challenge. We live in a society where there are students from many different backgrounds and motivations, and the “type” of student can be hard to predict. Adaptive learning could be a tool to help enhance engagement. Parkin, Hepplestone, Holden, Irwin, & Thorpe (2012) share outcomes from a study in 23 undergraduate courses where students share feedback on their experiences of receiving different forms of feedback with varying degrees of technical intervention. Through this qualitative study, students expressed that this information “significantly enhanced students’ engagement” (Parkin et al, 2012, p. 963.) The overall findings suggest the feedback better informed students and allowed for reflection.

Understanding prior knowledge and motivation can also be very powerful to support the teaching and learning process. Another study assessed whether “the goals of an adaptable tutorial, which individualized instruction based on student motivation and prior knowledge, were being met (i.e. knowledge gains and motivation gains) and identified weak or problematic areas, in terms of usability, where the tutorial could be improved” (Flores, Ari, Inan, & Arslan-Ari, 2012, p. 251). This study also had a large number of participants, with 186 undergraduate students included, and research consisted of two stages. Data was obtained through several
qualitative study mediums and preliminary results indicated that students were pleased. One observation from this study was certain groups benefited more from the use of adaptive tutorials. The goal of this tutorial was to benefit all students, no matter what their knowledge or motivation was. With that, results indicate “low prior knowledge students benefited more than high prior knowledge students” (Flores et al, 2012, p. 257). One suggestion is that in future studies, the design of content be better adapted to meet needs of advanced learners.

Finally, many institutions focus on using adaptive technology to support remedial efforts. One study looked at computer programming professionals in Taiwan and personalized remedial resources in computer programming courses. Learning and mastering this topic is not easy. Reviewing feedback from students, concepts were designed to provide an adaptive learning path for students. As noted by Tung-Cheng, Ming-Che & Chien-Yuan (2013), the resources were mostly remedial materials. After two months of using these resources, test scores for these students showed significant improvement. Outcomes from this study suggest that this environment could be adapted for any e-learning environment and “confirmed that the method of this study has achieved the effects of remedial learning and adaptive learning” (Tung-Cheng et al, 2013, p.32).

The growth of digital materials

Previously mentioned is the increased availability of digital materials. One can identify a shift not only in content created and shared through Open Educational Resources, materials that are freely accessible and openly licensed, but also through major investments in educational technology and materials. Billions of dollars are being invested into higher education through technology start-ups. From Straumsheim (2015), $2.51 billion was invested in educational-technology companies during the first half of the year. Publishers are shifting their business
models to be technology companies as well. This investment in content and features continues to expand (as noted later in this review). Talab (2007) calls for a caution, preventing a “Wal-Mart” approach to higher education. Collective bargaining agreements and intellectual property rights are considered as it is associated with the shifting model of developed courseware being a key teaching medium.

Third-party vendors, such as publishers, are transitioning to technology platforms that integrate tools such as adaptive learning. Content is pre-loaded into these platforms, from publishers, with faculty being able to allow and adapt their own content. One study assessed the effectiveness of an online learning system through McGraw Hill Connect, LearnSmart. Outcomes are shared in an undergraduate anatomy and physiology course. Across six institutions, pre and post-tests, grades, and retention were considered. “Overall, we found no significant improvement in any metric between sections using LearnSmart and those given online questions” (control group) (Griff & Matter, 2013, p. 170). With that, two schools did show better results, yet the authors could not identify any specifics as to why. It is summarized that these systems may perform best when “course goals are closely aligned with texts and the adaptive learning system” (Griff & Matter, 2013, p. 170).

Another example is a platform designed through Carnegie Mellon that is now being used at other institutions. As noted in Kaufman, Ryan, Thille, & Bier (2013), in a major study involving several Open Learning Initiative courses used in U.S. community colleges, students using the courseware covered 33% more content in the same time as compared to their peers in traditional courses and achieved a 13% learning gain, compared to 2% by peers in traditional, face-to-face courses.
Conclusion

There has been tremendous expansion in both online and blended learning over the last decade, and understanding the investment models, challenges, and opportunities for small colleges is important. In addition, there have been large investments in both private and public organizations to transform how technology can impact the experience and delivery of higher education. Digital materials and technologies, many used in blended and online environments, are finding their way into higher education at an unprecedented rate and provide both challenges and opportunities around how we deliver an academic experience.

It is proven that learning analytics and predictive modeling can have beneficial impacts at many levels of the institution, including the regular teaching and learning environment, but also in an online environment. Learning analytics can be used to prevent and ensure success, allowing faculty to deliver a personalized education for students and to intervene where appropriate. While recent studies show success, there are a few major concerns around the future use of learning analytics. Not only does there need to be further, large-scale research, but the use of analytics and concerns around privacy and use need further research. Finally, professionals in the field are also sharing models and proposed approaches to using these technologies. This could create new opportunities for collaborative efforts in higher education and online education.

As suggested by Flores (2012), development of some of these resources can be time-consuming and costly. Adaptive platforms need to consider content that target students at various levels. An example of this being applied in remedial work shows that this technology is applicable to students at all different levels. With the option of building many in-house, publishers and other third-parties are also developing adaptive technologies. While some may
not be seeing improvements in outcomes, considering course goals in environments with already-existing content may be appropriate to support outcome improvement. This technology can support not only face-to-face, but blended and online learning as well. Finally, while the above focuses on higher education, it is important to understand that adaptive learning is applied in the K-12 education too. In Giacomo Dina, Vincenza, Mascio Tania, Maria Rosita, Daniela, Rosella, & Pierpaolo (2016), adaptive learning can be an ally to promote great cognitive development. It shifts, quite deliberatively, how we approach the teaching and learning process.

**A Critical Lens on Students, Faculty, and Administration (Leadership)**

Flexible learning environments provide personalized learning models for students. This may be in terms of degree or credit completion or preference in mode of delivery. Many technologies are forcing a consideration for when and how students learn and traditional models are being challenged. Students today grew up with mobile devices, social media, and are living in a constantly connected world. This technological culture and impact experienced in society carries opportunities and challenges into our educational systems. In addition, it is important to recognize the average “type” of student is shifting nationally and there are more professionals participating in higher education. Flexible learning paths and options can support new models and busy learners, yet those options challenge some of the current political structures that have been put in place in academia for some time, including the academic governance and academic freedom for faculty. Finally, the role of Information Technology (IT) and IT leaders in these conversations is becoming more expansive, potentially offering strategic partnerships in innovating with the business of educating.
Students: meeting students where they are and flexible learning models

Prioritizing several modes of delivery is a way of meeting students where they are. One study considered in this research looks at student outcomes in a special education course, comparing outcomes between three modes of delivery: face-to-face, online, and hybrid. There were 159 students in a traditional lecture course, 69 in fully web-based courses, and 69 in a hybrid section. Researchers measured the effects of the independent variable (mode of instruction) on the following dependent variables: (a) perceptions of preparedness for teaching students with special needs, (b) dispositions toward teaching students with special needs, (c) effectiveness of the learning experience in each group's mode of instruction, and (d) academic performance in the class. Student perceptions, discovered through a questionnaire, “suggested that students found each of the courses to be equally manageable and equally effective at promoting their learning. Students perceived the online course to be the most flexible and adaptable to their individual needs.” (O'Brien, 2011, p.29).

Another potential reason for providing flexible learning is that there is an increasing trend in student dissatisfaction in education, drawing attention to the concept of student engagement. One factor is student engagement with academically purposeful activities. Low engagement is considered a main reason for dissatisfaction. An article from Delialioğlu (2012) worked with 93 pre-service computer teachers, where an online learning environment was blended with a lecture-based instruction for the first eight weeks of the semester and then with a problem-based instructional approach for the second eight weeks of the semester. There were no significant differences found for level of academic challenge and course satisfaction that could be explained. Regardless of strategy, students were highly satisfied with the course that was configured as blended. There were a variety of teaching mediums that could be a solution/answer. In
comparison to the lecture-based part of the course, students were more engaged with active learning strategies and spent more time on academic activities during the problem-based learning part of the course.

Another study shares outcomes from two experiments, both conducted to assess online, personalized systems of instruction in blended learning design. In both experiments, the online platforms supported better outcomes, including critical thinking and general course knowledge. As concluded by Svenningsen (2011), these positive outcomes in both experiments indicate there is an effective component for developing critical thinking and course knowledge in blended designs.

With various modes of delivery, it is important to recognize that further research is needed to better understand how different learning environments impact teachers’ daily tasks and teaching practices. Online, specifically, continues to be one of the fastest growing learning environments. Additionally, when prioritizing different mediums of learning, students must also understand the change in relationships. In online and blended formats, students are not face-to-face with instructors and peers as much, meaning this could change their perception of value. For example, in one study focusing on delivering online, hybrid, and face-to-face education, students perceived the following about an online environment: “the instructor as impersonal, stringent, inflexible and uncaring” (Senn, 2008, p.275). Future research needs to focus on large-scale studies.

Technologies, such as mobile devices, allow students to learn anytime, anywhere. Research suggests it is important to consider faculty development around the use of mobile technology. While some may simply expect for these tools to be used in education, noted in Ekanayake & Wishart (2015) is the importance of educator development in order to support
successful implementation. Through a three-day workshop, followed up by another day after application, educators identified potential use and had a significant change in perspective after the opportunity to learn and collaborate. Mobile technologies feed into the role of other technologies – such as social media. “Considering the potential and popularity of social media, it is important to inquire into its use in learning” (Ricoy & Feliz, 2016, p. 237). Miron (2015) shares a framework for using Facebook as a learning management system. In flexible environments, some look to social media and online web tools to provide students flexible and on the go learning opportunities. This also brings about a blending of personal and professional resources. Twitter, specifically, has been identified as a tool to support online learning communities. Popular in some professional fields, higher education can look to a study of Twitter use at the university level. Through a mixed-methods theory, outcomes share that “beyond a catalysing function, the present study reveals that the use of Twitter to carry out training with university students is a feasible proposition. Moreover, it promotes a pleasant and motivating learning climate” (Ricoy & Feliz, 2016, p.245). Finally, when considering some students may have scheduling conflicts, an example including residents in the medical field, some have considered asynchronous approaches to learning. In Galiatsatos, Porto-Carreiro, Hayashi, Zakaria, & Christmas (2016) find social media tools, including Twitter, support online learning communities and could be used in medical education. This study showed significant increase in online communication via social media in just six months, providing resident students online communities.

Finally, when researching approaches to learning, it might be helpful to consider what is happening in the K-12 environment. Many students progress into college with the habit of using some of these technologies in earlier education. Not only can we learn from the students, but the
teachers that are using these technologies and why. In Grant, Tamim, Brown, Sweeney, Ferguson & Jones (2015), the themes that emerge in application including: ownership and control, administrators championing for use and student accountability, use for motivation and curricula enhancement, professional development, and consideration of technical issues. In Clarke (2012), through qualitative research, the importance of teacher training in the application of these technologies is reviewed. Empowering educators promotes the use of technology, motivates students, and provides educators with data about their pedagogy. Opportunities, as reported by Knowlton, Fogleman, Reichsman, & de Oliveira (2015), suggest also pairing faculty at the college level with teachers in K-12 to create collaborative and networked environments focused on student outcomes.

**Faculty: challenging traditional models and the shifting role of faculty**

As noted in Bevins (2011), today we live in an information age and a knowledge-based global economy. Pressures previously noted from the external environment have a potential impacts on the current design and structure of academia, specifically governance models. While some may view this as a fairly new disruption, specifically through the consideration of technology, we see a historic perspective from Martin (1973) on what innovations in higher education would most likely receive support from leadership/administration. This includes: experience, independent study, instructional technology, innovative graduate programs, faculty promotion and retention, nontraditional studies, school-community relationship, student evaluation, educational philosophy, and teaching/learning modes. Even at that time, instructional technology and other noted innovations had potential impact, placing what is seen today as not necessarily “new”, but perhaps timelier.
Erkan (2011) defines commercialization as a major trend having potential impact on academic freedom. For the small liberal arts college, as noted in Bevins (2011), the importance of liberal arts versus technical disciplines challenge relevance and value in today’s society. The lives of today’s students are filled with technology and entertainment. Technology, course content, and delivery are all considered. As noted in Bevins (2011), “all levels of educational institutions are being forced to assess their productivity, their curriculum and course content among other things as a result of such technological changes and the current financial crisis” (p.12).

Through this change, there is a strong desire for faculty leaders to be involved. From Ciabocchi, Ginsberg, & Picciano (2016), governance leaders remain skeptical about quality and rigor, as it relates to online and new models of delivery. Concerns shared in this study include the time required to develop and deliver courses, academic quality of courses, compensation for teaching such courses, time and effort required for faculty development in blended/online teaching and learning, and a perceived overuse of adjunct faculty to teach blended/online courses.

In addition, there have been many changes to copyright and matters of intellectual property in recent years. As noted from the American Association of University Professors, intellectual property refers most importantly to the products of faculty, staff, and student research and scholarship. The online course revolution is also seen as challenging the rights to instructional materials, as it relates to online courses, given the investment from institutions to support the design and execution of courses. Given the popular shift in many course materials being delivered online, even in a more traditional environment the lines are being blurred.
In *Copyright in higher education: A review of modern scholarship* (2016), there are challenges in enhancing a modern understanding of the function and application of copyright law in higher education. Technology did not alter the ownership question, but what has emerged is a position that the college would claim copyright ownership in technology-based course materials that have used significant institutional resources. A work-around for many has been a work-made-for-hire. From *the legal implications of online universities* (2002), this approach gives employers ownership of the work that others create when prepared in the scope of their employment and in a written instrument. Consideration is expanding here as more and more online material/technology is being introduced. The copyright and material would belong to the teaching institution in this agreement.

Finally, from *Distance education and intellectual property* (2000), there are suggested examples where employment contracts can serve to shift ownership from author to employer. Moving forward, institutions may want to consider the specific clause(s) in the contract(s) that clarify roles, intellectual property, copyright, and ownership around specific efforts or initiatives.

**Administration (Leadership): The expanding role of technology leadership**

Smith & Cohon (2005) identify the unprecedented technological change that has been occurring for the last decade (plus) and the growing complexities. IT organizations are more than just infrastructure. The focus is now becoming more about leveraging infrastructure to support strategy and mission. Dlamini (2015) makes it clear that the CIO position is no longer highly focused on technical issues, but has influence on the institution's mission critical strategies, which clearly shows that the position has experienced organizational ascension.

For years, technology has been identified, in many industries, as a tool for reducing costs/finding efficiencies. While not necessarily a new concept, specific to higher education,
technology has been playing an increasing role in the recent conversations. We see this most clearly in the rapid expansion and role online learning is playing in the United States today. From the Online Learning Consortium (2016), there is a 263% increase in online education increase over the last twelve years. Today’s learners are dynamic, a mix of traditional and non-traditional, with 90% believing online education is comparative or better than traditional forms of education. New models of education, including blended and online, are growing at significant rates nationally. Recently noted, 77% of institutions offering online learning say it is a key solution to their long-term strategy. Many IT departments, and leaders, are being called to do more than just provide infrastructure and support – many are being called to support academic innovation, delivery, and to be partners in supporting institutional initiatives.

Conclusion

It is important to have a broad understanding of key stakeholders and traditional and engrained roles, cultures, and processes when considering the challenges and opportunities between technology and academics. At this time, it is fairly proven that online and blended learning provide a quality education, just like traditional, face-to-face instruction. Where it seems that there is room for flexibility is around the learning pathway for how students complete their coursework and in what order. There is also a large ecosystem to consider when thinking about these flexible pathways and key tools such as social media, web tools, and mobile technology to support personalized, just-in-time learning.

Perceptions of faculty is something to consider along with research as to whether these different pathways, while helpful for students, saves higher education institutions money. Faculty development is an important consideration that supports the successful use of these technologies and can change thinking around pedagogy. It is recognized that now, more than
ever, external pressures have potential to transition (potentially force) higher education through change and reform. Through this process, faculty will have to play a key role, understanding a potential shift in their work and the supporting pillars of their scholarship and research. Leadership will have to understand the changing practices of copyright, intellectual property, and contract writing.

The campus IT organization can become a key partner and facilitate in the process of innovating. From Brown (2014), opportunities lie in becoming actively engaged in the teaching and learning mission of the institution. The key is not just being a supporting player, but a proactive change agent that works to enable the institution to construct new ideas and vision. With that in mind, it is important to consider the role of the Chief Information Officer. Some institutions have taken steps forward in organizational restructuring. Wenhong (2016) emphasizes the inclusion of the CIO in top management teams as an indicator of how the organization prioritizes technology as a strategy.

**Productivity, Efficiency, Costs – the potentially dirty, yet necessary words in higher education**

As noted in Levin (1991), it is important to define productivity in higher education. For the work ahead, we consider this reference to an increase in educational outcomes relative to costs. Historically, many administrative and financial decisions are made by central administration, but curriculum, staffing, and instructional decisions are made at a decentralized level (departments, schools, and other units). This signals approaches to improving academic productivity cannot be done without cooperation of decentralized units. In relation to that thinking, one might look to various models to consider cost, such as *Total Cost of Ownership*, defined as all the costs directly related to the ownership of an item (Frederickson, 2013). The
work of Levin (1991) also discusses ways in which higher education can increase productivity. There is a tendency to separate administrative decision making from academic governances. The take-away here is that in addressing this work, collaboration and governance models must be considered.

Mirrlees & Alvi (2014) consider a historical perspective on how technology has been suggested as a way to yield new efficiencies in higher education. Suggested is the fact that there have been longstanding attempts by United States leadership to apply new communication technologies to educational labor process as a way of making it more “efficient”. When translating that model into higher education, this can cause fraught power relations between leadership and faculty. Considered as well is the thought that solutions around a society’s need for technology can be driven by a network of organizations within society and not always from the university itself. We consider this perspective as well in terms of “pressures” causing higher education to change. A key statement suggests one might consider how technology can innovate versus automate. From Wei-Chen, Hung, & Jeng Ifeng (2013), the internet is being shaped by technologies where productivity and collaboration are playing key roles in peer interaction. With a huge culture shift focused on productivity, collaboration, and inclusion, there is a transition of expectation into the higher education environment. It seems it is one that cannot be ignored.

Finally, from Neal (1984), consortiums have been considered, for some time, as an opportunity to build bridges to create flexibility, expanded resources, and identify some efficiencies. In Bai & Smith (2010), there are examples from institutions who have created shared modules/course content that are used at several campuses, allowing students to choose their delivery preference. Larger, collaborative examples, such as the work of Council of Independent Colleges (CIC) are also growing. Over 2015, a small group of colleges
experimented with designing online, high-level humanities courses to offer at all colleges. With forty-three designed courses, schools were allowed to offer all in their catalog, expanding their offerings without increasing overhead. Some noted outcomes from Alexander (2016) include:

- “In the second year of the program, instructors spent less time on planning and delivering the course. All faculty felt more comfortable with online learning pedagogy;
- Students had positive learning outcomes in these courses, and faculty and peer assessors ranked student outcomes favorably;
- Although there were no face-to-face instantiations of these online courses, both faculty and students rated the online courses as comparable.”

The word productivity can be considered cautioned in higher education. The work to address opportunities must come from several groups on campus, including leadership and faculty, as noted through some of the literature examined. With that, technology is playing a rapid role in shifting our communities towards productivity and collaboration. In addressing some of these challenges and opportunities, examples of collaboration through consortiums, offering extended services while limiting over-head, are considered. The work is still new.

**Summary**

Through a review of this literature, there is a strong case made that there are significant, increasing pressures on small, private, liberal arts colleges in New England. This is clear through both the financial pressures and demographic challenges currently facing small, private colleges – with a direct threat to colleges in New England. At the same time, the value of the liberal arts degree continues to be under scrutiny, adding a layer of complexity to how small, private, liberal arts colleges position themselves for students and families in today’s world.
Many of these pressures are encouraging leadership, staff, and faculty at various levels of institutional arenas to engage in new and timely conversations.

In order to engage in these conversations, it is crucial to consider the literature and changing trends around how an education is being delivered. It is clear technology has a tremendous impact on that conversation. There is a significant growth in online and blended learning, along with digital materials to support such delivery, with several studies connecting outcomes as equal or above a traditional delivery model. The shift to this format of learning comes from both internal and external pressures on academia. In shifting towards new models, the work must continue to ensure a quality for our students. To consider a personalized, quality education, understanding the upcoming models and impact that learning analytics and adaptive learning are playing will be important. Also, it is important to seek a general understanding that students may want to learn through new models now and in the future and that technology plays a key role. The research in those areas shows the need for continued research and understanding, but much is working in these areas, continuing to challenge a traditional teaching and learning academy. There must be considerable investments made by institutions to understand the role alternative delivery can play, how it supports a healthy enrollment strategy, the student experience, and how to assure quality through key deliverables such as faculty development. Many are identifying online and alternative delivery as key for long-term strategy and survival. Some models are proving cost savings, recognized at varying areas and levels of the institution(s). As higher education shifts into these new arenas, historical governance models and the role of faculty have the potential to shift. This work will require a strong, collaborative vision between leadership, faculty, and other members of institutions and a very clear understanding of institutional priorities.
The campus IT organization can become a key partner and facilitate in the process of innovating. The key is not just being a supporting player, but a proactive change agent that works to enable the institution to construct new ideas and vision. To understand opportunities around cost savings and productivity increases in higher education, history can help lay a framework for understanding barriers and opportunities. There are also levels of recognized impact, at a local level, or at an institutional level, potentially changed by consortia.

The work towards understanding how to continue delivering a flexible, quality education, while potentially addressing cost and overhead, will be different for private/public and institutions of various sizes. There is proven literature that this work is new, yet is having varying impact and perspective. By considering this work through the lens of technology leadership at varying institutions, it is the hope we will be able to consider new ideas that truly change how we deliver an education and provide sustainable cost models for both institutions and paying families.

Chapter Three: Research Design

The aims of research in this particular doctoral program is to examine a complex problem of practice, generate knowledge from data gathered at the research site, and provide context and strategies for introducing systemic change to help resolve the problem of practice.

There are significant, increasing pressures on small, private, liberal arts colleges. This is clear through both the financial pressures and demographic challenges currently facing small, private colleges – with a direct threat to colleges in New England. At the same time, the value of the liberal arts degree continues to be under scrutiny, adding a layer of complexity to how small, private, liberal arts colleges position themselves for students and families in today’s world.
Many of these pressures are encouraging leadership, staff, and faculty at various levels of institutional arenas to engage in new and timely conversations.

The purpose of this qualitative study is to explore how Chief Information Officers (CIO) make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges. The specific research question is: How do Chief Information Officers make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges.

Chapter three will discuss the qualitative research approach, with an overview of the specific strategy of inquiry, including background information, intended outcomes, why appropriate, and how it will shape research questions. Participants, procedures and data analysis, and criteria will also be reviewed. As part of criteria, ethical considerations, credibility, transferability, positionality, and limitations are considered.

**Qualitative Research Approach**

Both qualitative and quantitative approaches are empirical methods in that they involve collection, analysis, and interpretation of observations and data (Ponterotto, 2005, p. 128). Qualitative methods, specifically, refer to a broad class of empirical procedures that are designed to describe and interpret the experiences of research participants in a context-specific setting (Denzin & Lincoln, 2000b). Generally, qualitative findings are presented through the language and words of participants and describe a psychological event, experience, or phenomenon (Taylor & Bogdan, 1998). There are specific characteristics of qualitative research, dependent on the research design and a chosen inquiry approach.

As outlined in Ponterotto (2005), a paradigm is a set of interrelated assumptions about the world. It helps set the context for a research study, including a set of philosophical and
conceptual frameworks. Paradigms help researchers determine the various methodologies and the tools and instruments that will be used in research. Additionally, paradigms also determine participants and the researchers level of engagement and participation. There are numerous research paradigms that can be used to guide research, but the one specifically focused on for this research is Interpretivism - selected based on the researcher’s philosophical alignment with its assumptions.

Interpretivism is recognized as an alternative to (Post) – Positivism, with reality being recognized at a singular level by an individual (Ponterotto, 2005). In order to bring an individual’s reality forward, the researcher focuses on methodology that encourages deep reflection. In line with Freire’s (2014) reflection of the inclusion of the other, Interpretivism calls for co-constructed findings and dialogue. The researcher and participants work closely together, understanding “lived experiences” from those that live it daily. It calls for a hermeneutical approach, maintaining that meaning is hidden and must be brought to the surface through the process of deep reflection – which can be stimulated by the interactive researcher–participant dialogue (Ponterotto, 2005). There is also an effort to pull previous experiences from the subconscious through social dialogue - supporting deep, reflective realities. The work is grounded in experience, not abstract, and the approach moves beyond phenomenology (participants’ accounts) and attempts to report on the participant's experiences by considering the researcher’s own view of the world (researcher's interpretation). In considering the role of double hermeneutics, the interpreter’s analysis unmask hidden phenomena that might be present. This research method considers a smaller number of participants to support the process and allow for depth. It is common to have 2-3 interviews with each research participant to support such depth. Interpretivism is considered the foundation for qualitative research,
therefore the research method for this work is grounded in an Interpretative Phenomenological Analysis (IPA).

The IPA method was chosen for this research to allow for deep, personal reflections that will hopefully surface new themes and ideas for addressing the research question. When looking to the literature review that supports this research question, much is presented through quantitative research and findings. In addressing this work through a qualitative, and an IPA approach, the goal is that reflective and transformational ideas will surface around the research question that builds on individual experiences. Seeking their honest, and potentially controversial, thoughts, perspectives, and predicted opportunities, will hopefully benefit not only the research participants, but the field of higher education at large. Some of the challenges facing small, private, liberal arts colleges are unprecedented, calling for a variety of dynamic approaches and perspectives grounded in experience and deep reflection.

The IPA approach will shape questions asked, the form in which data is collected, and impact the steps of analysis. As previously mentioned, in this method there are a smaller number of participants (8-12). Questions will be asked in an interview setting, with the research participant actively guiding the interview process. Questions asked will support a clarity of key terms and sub-questions will be important for probing for deeper reflection and/or clarity around specific questions and responses. Questions will focus on experience, perspective, feeling, and pulling at lived experiences of participants. Specifically, these are questions that focus on exploratory versus explanatory (Larkin & Thompson, 2012). The analysis will be very personal, seeking to understand the interviewee’s perspective from the researcher’s position. The analysis will be extremely detailed through transcription and coding.
Participants

In line with the purpose statement and research questions, the participants chosen as part of this research study are Chief Information Officers (CIOs), also known as Information Technology leaders, throughout small, private, liberal arts colleges in New England. Given the focus is on professional position, there is no specific call for age, gender, or ethnicity. The assumption is that the participants, given each will represent a different institution, will bring a certain diversity and perspective to the study.

To determine the research participants to be part of this study, criterion sampling was used. Criterion sampling involves selecting cases that meet some predetermined criterion of importance (Patton, 2001, p. 238). In this case, the criteria was not only about the professional position of being at the CIO level, but, given the scope of the research question, participants had to work at small, private, liberal arts colleges throughout New England. An email communication went out to a variety of leaders, with the goal of gathering 8 – 12 willing to be part of the research study. It was expected that a few might have to back out, with the lowest number being 8 participants to provide enough variety and context to support the research question.

A sample size of 8-12 participants was chosen given the design of an IPA study. It is common for there to be 2-3 interviews per participant to support the depth and scope of an IPA study. When considering a sample size, typically researchers want to achieve enough information without redundancy of saturation. As Sandelowski (1995) points out, "determining adequate sample size in qualitative research is ultimately a matter of judgment and experience," and researchers need to evaluate the quality of the information collected in light of the uses to which it will be put, and the research method, sampling, and analytical strategy employed. IPA
studies require small sample sizes – it is the quality, rather than the quantity of the data that is important (Larkin & Thompson, 2012).

Traditional and virtual (Skype or Zoom) interviews are appropriate and will be conducted (Hinchcliffe & Gavin, 2009) for the setting of these interviews. Audio recordings will be captured to support transcription and to capture participant’s experiences.

**Procedures**

The researcher will complete several steps in the research process that are both common and best practice for qualitative research, but are also specific to the IPA method. First, establishing relationships with the potential research participants is important. Informal conversation opens the door for confirmation of participation and helps establish a level of comfort that supports an IPA method and the desired relationship between both researcher and participant. The researcher will ask participants to read, sign, and return the Northeastern University IRB approved consent form. Once completed, establishing an interview schedule that works for both researcher and participant will be important. Virtual calendars will be used to identify common times. Prior to the interviews, participants will be asked to select a pseudonym to ensure confidentiality. Traditional and virtual (Skype or Zoom) interviews are appropriate and will be conducted (Hinchcliffe & Gavin, 2009) for the setting of these interviews and will be recorded for transcription and further review. The interviews will be immediately transcribed. In line with IPA data collection protocol, the interviews will be semi-constructed, allowing for flexibility and for sub-questions to be asked that allow for further exploration and storytelling as part of the IPA design. Smith (2015) highlights semi-structured interviews as an exemplary data collection method for IPA research. In this manner, the interview will have a set of questions and a schedule, but the interview will be guided by the schedule rather than dictated by it.
Creswell (2012) emphasizes the importance of storing data safely and securely. The researcher has a role to maintain the integrity of all data collected during the interviews by protecting it from theft, damage, loss, or otherwise. It is wise to establish a process for data management, applying names (with desired pseudonyms) and dates to all data files and documents. Field notes, recordings, and data transcriptions will be backed up on external hard drives and kept in a locked space. After an extended period of time, and when all work related to this research is complete, all materials will be destroyed.

**Data Analysis**

The first step in the data analysis stage is to transcribe all interviews. For this work, a transcription service will be used, with the researcher requiring a confidentiality statement and a verbatim account of all questions and answers outlined in the interviews. Smith (2015) discusses the importance of meaning in analysis and the aim as a researcher to understand the content and meaning of that content in context to the participant. While identifying themes is part of the process, frequency is not priority – meaning is. This requires the researcher to engage with the transcript in depth so the interpretation is rich, detailed, and reflective (Larkin & Thompson, 2012).

Larkin & Thompson (2012) provide an overview for the analysis process with IPA research. First and foremost, when interpreting qualitative data, the researcher aims to develop an organized, detailed, plausible, and transparent account of the meaning of the data (p. 104). Identifying patterns of meaning in the data is important. These patterns are commonly referred to as themes and are derived from a detailed, line by line review of the transcribed data (also referred to as codes). Themes are organized into a structure, such as a hierarchy or family tree (p. 105). Narrative context is crucial to guide the reader through the analytic process and
highlighting researcher interpretation of data as part of the IPA analysis. This process is interactive and inductive, meaning the researcher will cycle and recycle through this work, seeking new and missed ideas, meanings, and interpretations.

A more detailed dive into the analytic process, as outlined in Larkin & Thompson (2012), includes first, line-by-line analysis (coding) and an understanding for each participant. Identifying emergent patterns from that data (themes) is the next step, identifying convergence and divergence and where there is commonality for individuals, and then across all cases. Seeking a more interpretive account, the next step is to develop a dialogue with the researcher, coded data, and knowledge – what does this mean given the context? It is important to then develop a structure to represent the themes that emerge. As previously mentioned, a hierarchy or family tree would be an example of such a structure. Organization of the material that allows for the coded data to be traced from initial codes in the transcript, through the thematic process, and then into final themes is necessary. This supports the next process of considering trustworthiness, working to develop coherence, plausibility of interpretation, and reflexivity. A narrative, taking the reader step-by-step, theme-by-theme, helps immerse the reader into the individual experiences and contexts. Approaches noted in the following paragraphs support not only building trustworthiness of this research, but support external transferability. A visual guide, in referencing the structure, supports this work as well. A reflection of one’s perceptions should be noted throughout the process. One way that might be done is through a reflexive journal.

**Criteria for Quality Qualitative Research**

Lincoln & Guba (1985) emphasize that the trustworthiness of a research study is important in considering its worth and contribution. To ensure and establish trustworthiness, the following
is considered as part of this section: ethical considerations, credibility, transferability, self-reflexivity and transparency, and a consideration of limitations of the study.

**Ethical Considerations**

In qualitative research, participants may be asked to discuss private details of their life, or to share a significant amount of personal information. With that considered, it is important to build trust between participant and interviewee and to ensure best ethical practices. Creswell (2002) provides some guidelines for ethical practices, including informing participants of the purpose of the study, refraining from deceptive practices, sharing information with participants (including being clear about the researcher’s role), being respectful of the research site, using ethical interview practices, maintaining confidentiality, and collaborating with participants (p. 229).

Gaining access to a site and/or individual(s) in qualitative research is important and involves obtaining permissions – a key one including the Institutional Review Board (IRB) (Creswell, 2002). Any IRB focuses on research ethics and considers the research methods proposed for the research process and while being sure the rights and welfare of humans is being considered in the process. The IRB will support and guide the research, ensuring ethics in the process. Finally, communication with participants will be important in the process, including providing updates on the process and their rights as a participant - including the opportunity to not answer certain questions and allowing for an exit if they deem appropriate. All documents and materials associated with the study will be securely stored and pseudonyms will be used for all participants. Participant confidentiality is of the upmost importance (Creswell, 2002).
Credibility

As in all research studies, establishing credibility is important. Given the position of the researcher in an IPA study, the first method of establishing credibility will be peer debriefing. From Lincoln & Guba (1985), the process considers exposing oneself to a disinterested peer in a manner paralleling an analytical session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer’s mind (p. 308). This will help with considering biases and assumptions and help to become aware of position and posture with analysis. In addition, and identified as most crucial from Lincoln & Guba (1985), member checks through both formal and informal processes can allow for data, categories, interpretation, and conclusions to be tested with the members of the groups where data was originally obtained. It allows for participants to clarify any errors or wrong interpretations, among other things, although the method is challenged by some drawbacks that are important to be aware of in the process.

Finally, prolonged engagement considers spending sufficient time to learn culture and setting. A key part of this process is to establish trust and credibility. The researcher has already met and spoke with six participants prior to IRB approval to introduce the general problem of practice and to establish a foundational relationship prior to the study. As in line with IPA studies, the researcher will most likely interview each participant 2-3 times, supporting more immersion and engagement.

Transferability

Establishing transferability considers how results can be generalized and transferred to other settings and contexts. This is an important consideration in any qualitative research study, but especially for the purpose of this study, and wanting to make transferable impact is a key
pillar of the initial research goal. With that in mind, establishing models of transferability will be crucial.

One key way of doing that is outlined from Lincoln & Guba (1985), where thick description is an approach for establishing external transferability. This is done by presenting a significant amount of detail, including context, and emotion – voices, actions, and feelings. By providing as much detail as possible, the reader can put themselves in the moment (Geertz, 1994). This allows for conclusions and ideas to translate to other cultures and contexts.

In addition, by using the IPA research method, the research process is designed around a deep dive and considerable amount of detail around insights into one individual, their context, and their perception around phenomenon. The method itself supports the idea of thick description. This strict focus on the individual, person-centered, can also be referenced as an idiographic focus.

**Self-reflexivity and Transparency**

Briscoe (2005) discusses relationships between a scholar, their position, and how it relates to representation of the *other*. He signals concerns about positionality and misinterpretation for the other. Carlton (2008) defines: “positionality is a concept that acknowledges the complex and relational roles of race, class, gender, and other socially constructed identifiers” (p.3). My professional position, working in higher education Information Technology, positions me closely to my research question/topic. Many things I think about in my professional work are things I think about in my academic work as well. My participants, as well, are Information Technology leaders – titles and positions I work with closely and frequently.

Briscoe (2005) argues “for a more inclusive representation of the *other*” (p.16). Given
some of my potential biases, I believe inclusion is an important step I can take to do good, quality research. Brisoce (2005) shares an observation around those being observed not speaking and acting openly around those not part of their group. With this in mind, I reflect on how I connect and am part of my participant’s community – in terms of direct relation to the professional field. Considering this work through the lens of an IPA method supports a recognition of the researcher as part of the research process with participant(s). The research question is one we consider on my local campus and is one that I am part of answering through the lens of my institution.

Roulston & Shelton (2015) examine the role of the researcher and strong subjectivity, encouraging close reflection for those that feel too close to the topic. Considering how I spend 50+ hours per week, this is a reality for my work. Strategies for new researchers are suggested in order to help re-concept biases. From Roulston & Shelton (2015), strong objectivity can be achieved if researchers work hard to understand their own positionality. Gathering evidence from many different perspectives and vantage points supports an effort to not be guided by predispositions. I recognize I will have to be aggressive in my personal understanding and preconceived thinking in collecting a variety of evidence that could present different outcomes for my research. Some of those outcomes may not be what I might personally represent in my daily professional work. Efforts and processes around establishing credibility for this research can support my positionality as well. Researchers are called upon to be neutral, objective, and impartial (Roulston & Shelton, 2015). A considerable amount of work and reflection must be taken to be aware of that. Finally, this work is ongoing, meaning we must revisit our potential biases and evaluate our position frequently and thoroughly.
Limitations

IPA studies have been positioned as distinctive, yet also as problematic (Larkin & Thompson, 2012). Part of this might be due to the fact that there are common misconceptions that researchers investigate cognition directly. It is important to recognize that researchers in an IPA study are interested in acquiring different sorts of knowledge and meaning-making. People make meaning (p.331). By learning about participant’s relationships with the world, it allows for an understanding of what things mean for people within certain contexts. IPA research is always grounded in context, supporting transferability.

In relation to the Cynefin Framework, the theoretical framework for this study, from Ali (2014), was designed to help in understanding formal and informal communities and interactions of structured processes and uncertain conditions. Some critics of the framework suggest that it can be difficult and confusing and needs a more rigorous foundation. The risk with the model is that it might be referenced as just another 2x2 model without a solid understanding of its intended application. From Hasan & Kazlauskas (2009), to avoid this, readers are encouraged to employ a Cynefin ‘sense-making’ approach when considering new projects or reviewing existing ones. This might look like a team meeting using the framework as a basis for reflection, or a workshop with a trained facilitator. Full benefits and limitations may only be realized over time, specific to the industry and the ongoing context of its application.

In addition, some feel that it covers too limited a selection of all of the possible contexts (Firestone & McElroy, 2011). With that, the framework supports the use of both space (diversity) and time (change) to understand the perspectives of different stakeholders. Contexts that can be regarded in the use of this framework can be considered wicked, meaning problems that are ill-defined, several, conflicting criteria for solution definition, solutions which create further
problems, and no obvious indications of when enough has been achieved (Rittel & Webber, 1973). Some source, as well, that titles of the domains, noted above as known, knowable, complex and chaos, are a bit too ambiguous as well. The framework itself suggests the titles really fall into two categories, both ordered (knowable and known) and unordered (complex and chaos).

Chapter Four: Findings and Analysis

The purpose of the study was to understand how Chief Information Officers (Information Technology Leaders) make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges in New England. The analysis of the interview data among eight participants yielded four superordinate themes and eight subthemes. The superordinate themes and subthemes identified were: 1) IT positioned as strategy (1.1 CIO in the structure of the organization, 1.2 partnerships, 1.3 funding models, 1.4 internal reorganization); 2) Data (2.1 defining measures, 2.2 what are we measuring); 3) Alternative Delivery (3.1 online learning, 3.2 hybrid (blended) learning); 4) Consortium. Superordinate themes and subthemes were identified as those recurring in at least four of the eight participants’ interview data. Table 1 provides a listing of the superordinate and subthemes that surfaced through the coding and analysis process, as well as the recurrence of each theme across participants.
Table 1
Identification of Recurring Themes

<table>
<thead>
<tr>
<th>Superordinate Themes &amp; Subthemes</th>
<th>Will</th>
<th>Joe</th>
<th>Tara</th>
<th>Alex</th>
<th>Erin</th>
<th>Sam</th>
<th>Phil</th>
<th>Frank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) IT as strategy</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>1.1) CIO in the structure of the organization</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>1.2) Partnerships</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>1.3) Funding Models</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>1.4) Internal Reorganization</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>2) Data</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>2.1 Defining Measures</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>2.2 What are we measuring</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>3) Alternative Delivery</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>3.1) Online Learning</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>3.2) Hyrbid (Blended) Learning</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>4) Consortium</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

**Information Technology (IT) Positioned as a Strategy**

How Information Technology (IT) is positioned within the college was an important thread that surfaced in all conversations and interviews conducted as part of this study. IT positioned as strategy occurs when the department is set up to make the most opportune and quality impact on serving the institutional mission. In order to do that, both how the department is positioned in the institutional organization chart and how the department is funded and prioritizes its resources
were important connections to emerging strategy. When aligned, thought through, and connected to larger institutional mission, the ideas related to the research question were more insightful and encompassing of institutional opportunities and outcomes. Specifically, this includes where the Chief Information Officer (CIO), also known as an IT leader, reports to the organization, the information they are previewed to, the funding received, and the prioritized role they play as part of the overall institutional strategy and mission. Participants who had a varying reporting structure, most directly in line with the President of their institution, had broader insights into the challenges and opportunities facing the college and thoughts related to the research question. In addition, many spoke to their directed role in the strategic plan and mission of the organization – and both access to information and funding received fell in line with how they felt their work was progressing and how it might be able to support the research question at hand. In terms of how to use the resources provided, an important subtheme defined as partnership emerged again and again. Many spoke to the fact IT feeds into almost every arm of the organization and has very clear insight into how the college operates. This positioning and realization directly impacted thoughts related to the research question and how some are reorganizing their IT organizations or being positioned themselves. Therefore, the subthemes in line with superordinate theme one were: CIO in the structure of the organization, partnerships, funding models, and internal reorganization.

Chief Information Officer in the structure of the organization

The participants in this research study all shared their reporting structure and where they fall in line at their institution. Across the eight participants in this study, four noted they reported to the Chief Financial Officer and the other four reported directly to the Presidents of their college. Based on their reporting structure, there were varying insights into both the challenges
and opportunities facing the college and their answers and stories to questions related to the research question. Joe was one of the participants that reported to a President. He states: “The members of the President’s Senior Staff, which I’m one of, this is the strategic conversations that we’re having as we try to make sure that we’re financially viable…we understand these challenges”. He is very up front in the fact he understands the significant challenges facing the institution, they are a priority at his level, and he, among others, are working towards closing the gaps around those issues. He is also clear about how his position, and therefore department, is prioritized in the organization, saying: “the fact that making this position a Senior Officer at the institution is a statement of prioritization”. He felt his department was positioned as strategy in his organization. He even went on to share he realizes in some organizations IT leaders report to the CFO or someone else, but the fact his college chose to make this a Vice President position is again “a statement of prioritization and strategic importance.”

A divergence to this was another participant who reported to the Chief Financial Officer (CFO). While he shared his understanding for some of the challenges facing his institution, he was up front in the first minutes of the interview that “it’s unusual to find CIOs that report to the President, and that can be problematic”. He refers to the role IT plays in the strategic plan and shared significant frustration that by IT not having a seat at the table, there are missed opportunities. Alex shared that “specifically, when you have a CIO reporting to a CFO, now everything becomes a budget issue”. He feels so strongly about it that he brings it up consistently throughout this interview, noting its limitations and the fact it does not provide vehicles for the CIO to see where the institution is going at large. This limitation noted a divergence to the response Alex had related to the research question and specifically around academics. “I don’t have ideas to save money in academia…it’s a question I rarely get asked”.
He follows up, noting he thinks his organization should be thinking about that question. This is a divergence from Joe who reports to the President. Joe still admits the concept of saving money on the academic side is “not always a welcomed word”, but he understands that “at its heart, I think we and other private liberal arts institutions give an education almost as inefficiently as you can” and his response to ideas around it suggest he is positioned to be thinking about it.

Will was another participant who firmly suggested the reporting structure is crucial. Coming from the teaching side of the house, he was clear that he would not have taken the CIO job unless it reported directly to the President. When he was hired, he noted the President had a background in technology and saw it as “table stakes”, translating to the extension of the mission to add value and to innovate.

Erin was a unique participant who noted reporting to the CFO, but also has the opportunity to be on the President’s Cabinet, adding important value to her work. Tara was one who reported to the finance department and mentioned how they have a good relationship. Her overall perception around the reporting structure was not bad – she feels it has benefited her with access to funding. With that, she is very clear while her CFO is “top notch”, “her presence kind of shields us (IT) a little from the top levels”. Not having access to top leadership at the institution, in this case the President, is a barrier, surfacing potential limitations for CIOs and their departments with how they serve the mission of the organization in an opportune and quality way (strategy). This subtheme finding is important, as the honesty in the answers emphasize there are clear benefits – both perceived and experienced – in having a reporting structure to the President and leadership, allowing for a broad view of the institution.
Partnerships

One of the subthemes that emerged across all eight participants was the role Information Technology (IT) plays in adding value as a potential partner. How the department uses its resources to serve the mission of the college was important and CIOs defined that an important way in doing that was through partnering with others on campus. IT was noted as one of the departments on campus that had insight into how almost every department operates. Frank emphasized a few key things, including the fact “the CIO has to support everybody on the campus”. Given they deal with everybody, it is important to report to the President (of which he does). Building on that, he speaks directly about relationships and how those are crucial for moving efforts forward. Frank notes he is “always building those…you’re either refreshing them, refining them, reconnecting, you’re constantly doing that”. He values the process of governance, but mentions in order for IT to add value in the organization, partnerships and relationships are important. Given his success with designing and implementing the IT strategic plan, his President went as far as to give him an additional title focused on strategic initiatives. Frank leads from this position with no direct reports, but through relationships and prioritized institutional efforts. He feels his “thinking about technology as a strategy is drastically different” given his reporting structure to the President and that he is able to position IT as a strategic partner given his position in the organization. He feels those that don’t might be limited on impact. This statement of job title is an important divergence to note. Frank was the only participant that referenced a significant priority in his job that potentially challenges the traditional structures of IT in an organization. It puts his contributions from and center with the mission.
Phil is a participant that reports to the CFO. Referencing the thoughts of Frank above, a question that emerged throughout his interview was challenging the concept of where IT belongs in the organization. His focus is around the philosophical question: “…where does IT belong? Who should control IT, because IT should never be a special interest group for any one department. We need to be functional for the entire institution to be successful”. Through that statement and the interview, it was clear to me he might be suggesting a report to the President. Related to partnership, Phil was one that identified IT as a key partner in the organization. When he first joined his organization, his primary focus was to “get IT out of the closet”. He worked to make IT “a strategic partner, provide an Information Technology environment that enables faculty, staff, and students the access, resources, and support that the college establishes as necessary to meet its mission”. He feels strongly that they are the vehicle to reach its mission and goals. He emphasizes that project management and the ability to execute is value-add and stated:

…you would be shocked to find out that IT has no projects of their own. There is not one thing that we do in our organization that is for the benefit of us. Everything that we do is to support the institution and their mission.

Sam emphasized, similar to others, the importance and the philosophy of partnerships. She has gone as far as to reorganize some of her team and determined future hires on that concept alone. While the concept of a reorganization and merger was cost savings, she was quick to point out the move was also service oriented. She shared some changes in leadership across the campus have challenged that recently: “I felt like we operated more as in partnership across campus. So we’re working harder to renew that philosophy of it being a partnership. In IT, it’s always a balance of infrastructure versus strategy.”
Will was another participant who emphasized this message of partnership. A potential divergence for him, though, was his emphasis on bold leadership. He was transparent that most of the efforts underway were really to create institutional change and that IT was a strategic partner and leader in moving those efforts alone. He highlighted several efforts on the administrative side of IT, but shared a story of an outcome after a task-force report, going to the President and suggesting a pilot program “to address the availability of much better technical resources around instruction”. He ran with it when the academic side was slow to adopt, emphasized by his comment “that was not welcome or well received in academic affairs, and only finally five years later is there some melting of the ice around that”. He leveraged partners across campus to move the program forward and it was up and running in nine months. This is an important example of how Will is positioning IT as strategy, both in how he is positioning his department to best serve mission and how he is using resources in his department to spread to other departments for more opportune impact. It is important to note that in general, most CIOs could speak to the research question in light of administrative or business processes at the college fairly easy – the academic side proved a bit more challenging.

Funding Models

An emerging trend that was also discussed among participants was the role funding models play in how Information Technology (IT) is positioned as strategy. Specifically, being both financially supported, but also having a strategy for how and where to spend that money in line with institutional priority, was an emerging topic. It is important to note all eight participants noted similar challenges facing their institutions. All eight noted challenges around enrollment, discounting, and demographics (to name a few). All worked from a general understanding that times are tough – but some realized that more than others and everyone had a
different angle on efforts. Those reporting directly to a President signaled more confidence and were able to dive into more detail about some of those challenges. This is an important finding, for when a CIO is positioned as a strategy, they have access to significant institutional information that allows for their work and investments to make the highest potential impact on the organization.

Frank was one participant that spoke at length to funding to help support strategy. First, he shared the story of a financial model task force that focused on what it would cost to deliver an education. The commitment to looking at the financial side was a big story for Frank and he emphasized, once again, his role as both a leader on the President’s team and also as a strategic leader across campus as important to supporting such efforts. Frank mentions that when he came in, the college was ready to spend money and invest in IT. He states:

…the institution knew that it was prepared to spend millions of dollars. What it wanted was confidence that when the money was going to be handed over, that the projects and the work would get done and they would be done in a way that would build up, what I would call, the technology infrastructure, and that’s not only hardware and software but it’s people too.

Throughout the interview, it was apparent Frank felt IT was prioritized financially in his organization, and once again, his job title signals that priority in a big way.

Tara is a CIO who reports to the CFO in her organization. She emphasized the role of her board and the fact that many of them are in business situations where they understand technology. She stated: “…and they kind of have this sense that we’re behind. So that’s a driver”. She had a hard time defining how her department was prioritized related to strategy, sharing:
I’m not exactly objective. It’s hard, I think my gut feeling is I think there’s a core level of us that’s valued. We say this a lot, nobody calls us to say hey, the network’s great, or I went to class and everything worked great.

She sensed they are valued, but was not sure if the institution at the highest levels understands how critical the technology infrastructure is. With that, she noted her report to the CFO, who controls funding, was a value-add for her and the institution actually recognized the need to replace funding it lost in previous years due to financial concerns. The value of financial health would allow for the right things to be done.

Joe went into detail about the funding model for his department within his organization. Similar to the other two referenced, he outlined the model of budgeting for operating versus capital and trying to align budgets with institutional priorities. A unique divergence for Joe that was not communicated in other interviews was the fact he sets aside two percent of his budget for innovation. He stated:

One of the challenges right now, especially you know as we think about lean times, is balancing funds for innovation versus funds for kind of compliance or keeping the trains running…I haven’t mastered it, but I’ve deployed things that work.

He goes on to explain that at his previous organization, the two percent supported technology exploration – not knowing what the next 12-18 months would bring. Similar to others, he still seeks an “equilibrium of cost and things” and being cost conscious, which was translated that he follows a traditional budgeting model and process, as many do, that respects institutional need and reality.

Alex brought an alternative lens, mirroring Joe in some ways, that while funding was there, *how* that funding was organized might be a bit different if truly aligning his department
with strategy. It is important to note Alex is another leader who does not report to the President. He mentions his department as an operational necessity: “I think the institution sees IT much in the way I described it (current structure), as an operational necessity”. His thoughts related to ideas to support this research question – efforts to what he defines would strategically move the college forward – are not currently prioritized as strategic priorities given the funding models. He references a data warehouse or central data repository. He mentions: “as a strategic priority, funding would be different”. At current time, there is some lip service to the idea that the college is investing in and doing some work to support solutions Alex sees might help better position his organization. He states: “I think the institution sees IT as an operational necessity as opposed to something that can provide competitive strategic advantage”. He is clear that the funding models would need to change to make a different reality.

Internal Reorganization

One of the final subthemes that emerged as part of the superordinate theme of positioning Information Technology (IT) as a strategy was the way the IT organization is set up among other departments in the organization. This references the part of strategy that emphasizes how IT is set up to use resources to best serve mission and being willing to change some of those structures to do so. Sam was one of the first interviews where that became obvious. Sam was directly in the middle of a merger during her interview. She has oversight of close to eighty people, including the library, IT, and auxiliary services at her institution. One of the reorganizations that she shared was the merger of the library and IT Helpdesk. The driver for the merger was “both cost savings and service oriented”. She piloted the effort the year before and had good feedback. She noted it would frustrate her when one support area would send someone to another because of a lack of fundamentals. To better position her resources to do value-add work, she was
planning to move forward with it. She was humble and somewhat anxious in sharing this merger during the interview, which signaled a significant change for her institution. With that, it was clear this was a necessary effort in order to sustain, build, and improve.

The merger of IT and library was not uncommon among a few other participants. Joe mentioned they were both under separate umbrellas at one time, but when they chose to hire him, they brought them together under one Vice-President. He states: “we have started to break down those historical departmental structures because ultimately for us to achieve what we want to achieve, we’ve got to start acting, whenever possible, as one”. Similar to Sam, his college recently combined the circulation desk and helpdesk services. Key drivers, similarly, were to increase efficiency and improve services. He noted both areas still have specialization to meet overall goals, but to act as a cohesive division allows for future efforts and strategic work.

Erin spoke about her organizational efforts to shift resources within IT to the Ed Tech group. Specifically, she speaks to the fact they have been falling behind with technology in the mission of teaching and learning, with a strong reference to the classroom. With the change of a new academic leader, they decided to move Ed Tech to IT. As IT has been moving to the cloud and/or finding other efficiencies that potentially free up resources (people), Erin is shifting resources to Ed Tech. In reference to bringing people together, she stated: “And now they’re actually a strong group, their broad name is called educational technology and media services and they have twice as many people as they did, say, a few years ago”. She goes on to state some of the new, strategic efforts underway, including online courses.

Two other participants spoke to a similar move, where prioritizing resources in other ways has positioned IT to focus on more strategic efforts. Probably most disparate, though, is the move the institution took to move Frank to be focused, at a very high level, on strategic
initiatives. He shares it is most likely uncommon, but after his thoughtful and successful execution of the IT strategic plan, the President called on him. The college at that time was in the middle of the next strategic plan. Frank was a leader on the initiative, helping to infuse participation and shared vision. He shared:

Because of the success we had in putting together technology strategic plan and delivering on that, I was asked by the President of the board to lead the institution wide conversation on building the next strategic plan for the institution…once that planning was built, it was like well now we have to have someone to oversee it.

In comparison to all other participants, this surfaced as the boldest move any of the organizations had taken to prioritize IT and its leaders as strategy in their organization.

Conclusion

In order to position Information Technology (IT) as a strategy, all participants spoke to the importance of reporting structure. Some emphasized it quite deliberately. As previously mentioned, half of the participants in this study report to the President and the other half report to the Chief Financial Officer. Those that had a seat at the table with the President felt they were more aware and in some cases more supported to carry out their work. It is clear there are benefits in the reporting structure being set up for technology leaders to report to the President, as those that did had more expansive answers as they related to the research question.

In addition, positioning IT as a strategic partner required the exact word partner in it – partnerships to be specific. While some might see IT as operational, many participants spoke to the fact IT is one of the only departments that knows each functioning area of the college. This unique awareness puts the department in a position and when positioned as partners, strategic work can happen. The reorganization and positioning of some of the IT staff mentioned in this
study speaks to that as well. Prioritizing new ways to do things, including finding efficiencies and improving service, is, and will continue to be, a key driver for many.

Finally, the funding models are important and speak to how IT is positioned in the institution. Current financial pressures are posing challenges at large, but it seemed that for most participants there was a consistent commitment on behalf of the institution to keep infrastructure up and running, and for some, funding for new efforts. IT spends no money of its own, but is a department that is focused on supporting and building for others – building infrastructure that allows the organization to operate and grow. The CIO and technology teams can help partner and identify where spending might have the most impact. Several participants had strong opinions about what that might look like given their current understanding of the institution and where technology might drive efforts. Data emerged as a topic of concern and potential – with many referencing the need for prioritized funding. Data emerges as a major theme and one that many are considering building a strategy around.

**Data**

Data, data, data. Every research participant spoke to the power of data as it relates to the research question. For some it was a more emerging theme versus others, but it is important to note that all see value in how it would help move the institution forward. There are many ways in which you can define data, but in very general terms, the superordinate theme “Data” is defined as how institutions can use available information to make better decisions and even do some forecasting. It is no surprise since data is an emerging topic in the technology field at large. With that, it is different to think about how an organization builds out a data strategy and what the key reasons for doing so would be – making it part of strategy and culture. When data emerged as an opportunity, specifically related to the research question, the measurement varied in terms of both
cost savings and application/strategy for the best data use. This was an interesting finding. There was no “go to” measurement related to the research question or how anyone in this field might approach it. This was potentially predictable, with the administrative side having more obvious types of measurements. Specific to academics, it was clear while many had ideas that supported or challenged the notion, not many knew where to start. With that, some interesting ideas emerged. The subthemes in line with superordinate theme two were: Defining Measures and What are we measuring.

**Defining Measures**

When asking the research question, it was clear everyone had a different definition of what it would mean to save money on the academic side. While there were some themes, many had varying terms in how they would consider savings for their institution – and some mentioned how challenging it is to use those terms on their campus. On the administrative side, it might be an easier measure, as business processes can be analyzed, better automated, and so on. Many note it is easier and often more prevalent that they look to the administrative side of their institution for cost savings versus the academic. It is worth noting, though, that several mentioned it is important to be thinking about cost savings on the academic side. For a few, including Will, it is essential: “there is not status quo anymore”. Erin considers time as a key measure on the academic side of the house. She said: “When you talk about how technology can help on limited resources or something I think the one thing that you can have a common discussion with faculty, or academic chairs and staff, is about time”. She continued on and was clear that: “It’s really difficult to talk about efficiencies and saving money”. She shared ideas such as looking to save time on the advising process or references blended/hybrid courses as potential approaches to saving time.
Alex initially shared he was racking his brain to find a response to the research question. He stated: “I’m racking my brain”. After pondering a bit, he said he feels it isn’t pure dollars on the academic side, but more around efficiency as the driver. He shared ideas such as an advising module that “making advising smoother, more efficient, more effective, saving faculty time, you could translate that into money, and that is part of the question.” It is important to emphasize Alex is clear that “it’s a question I rarely get asked”. With that, he said “I think it definitely should.” It is important to notice the divergence between the perceived need for it to be prioritized question, yet one he rarely (if ever) gets asked.

Will mentioned total cost of ownership as a key measure for the utility side of the house, but the term diverges on the academic side. He considers the term to be productivity. He actually challenged the concept that a measure of student/faculty ratio might be a measure of quality when “…in fact it’s a measure of productivity. I think higher ed would be well served to adopt a different measure of quality”. This is an important divergence from other participants, for he challenged the entire concept that quality and “small classes” shouldn’t be the measurement of quality at an institution – that potentially in this day in age other quality measures and efforts need to be put in place and institutions need to consider the expense and sustainability of class sizes that are less than X (smaller). When Will looks to data as an opportunity to analyze things such as cost/course or department, he challenges the thought that at some point:

…you can have a real discussion about the value of that academic objective versus the cost of that academic objective. It may be that there are other ways to improve the academic image of the college that are not as expensive.

Joe, similarly to Erin, looks to the term efficiency. How that term is translated is important. Specifically, in an educational institutional, Joe warns “business talk” can be something people
don’t want to hear about. He notes the importance of the stage for the conversation - and shared an example where he looks to stories where peers have done work that might have benefited the institution financially and still had quality, academic outcomes. He noted: “…the degree that we respond with what our peers are doing and using that as an opportunity to help create an opening to at least have a conversation” is valuable and gives credibility to the conversation. This word of caution related to “business talk” was clear throughout several participant interviews. Phil, as well, noted that:

I would probably get less of a negative response if I stood up in church and swore. They (faculty) hate being referred to as customers, they don’t like business requirements, they can’t stand being referred to as business partners. We don’t use those terms, but we kind of navigate around the little rocks in the stream, so we don’t bump into them and cause ourselves to get hooked up on terminology hang-ups.

Frank emphasized the challenge and vagueness in definitions as it relates to the research question, and emphasized:

I mean you can come up with any metric you want. I’m not sure if any of them really tell the full story. I think what happens, and this is where having been in the industry and now being in a high rated institution, where it becomes harder on a campus.

He goes on to share economies of scale are set up to be different in higher education due to the different cultures and variables, specifically on a small campus. Department sizes vary and some “will consume a disproportionate amount of resource, be they people, time or money”. The process for looking at and using data was considered one of those “business efforts” to several participants – but still, many found it as an important solution to some challenges and opportunities facing higher education.
What are we measuring

While the terms of measurement proved challenging to define, *what* to specifically measure also varied for participants - for example cost/course or cost/program. There were varying answers, but most participants did agree at large that current, relevant, and accessible data was important to helping understand the overall strategy of where an institution might want to invest and where/how to reduce/save costs. Alex had a very emerging theme around data from his interview. He mentions: “There’s a lot of lip service, I believe, for the terms data-driven decision making or information-driven decision making, data informed decision making…there’s a lot of lip service to that”. To do it well considers investment and strategy in the eyes of Alex. He notes that making a strategic priority would prioritize funding differently. When asked what that would look like, he specifically mentioned:

We’d be able to fund things like data warehouse or a central data repository. And then, we would be able to run data analytics or data science techniques against that data as well as be able to purchase and pull in other market indicators in terms of data and be able to come up with the models that might predict better what our enrollment yields might be in different areas, but we’re not doing that. He later goes on to use the example that data could help understand what majors the students they are recruiting want. All of these points of data support better understanding and could help save the organization time and money. He was very confident in his thoughts around what he would do and it seems he has considered this strategy for his institution for some time. While some might be using the terminology, Alex painted a clear picture of what that would truly look like in action.
Will spoke to data repeatedly and even went as far to recently hire a Director of Business Intelligence with a key focus on data governance and data use. When asked about cost savings on the academic side, he noted it is a tough nut to crack. He stated:

I do think that the thrust that holds the greatest potential there (around the research question) is the data analytics. It’s not that we’re going to necessarily get new programming or new software, but I think the analytics should give us information to think more carefully about class size, or program size, or cost per program.

He mentions those are things that have been on the list for a while – things he has been thinking about. Culture has gotten in the way. It requires, according to Will, each office does not own its own data. He emphasized you must be able to look at data across the college to make decisions. He goes on to share that a down to the person analysis could help address the research question. He once again stated:

The real analysis needed takes this a level further. It’s not number of students times average tuition revenue less faculty salary and faculty compensation for that. It’s the actual students in that course, what they actually pay after their financial aid award, and which faculty member it is and what percentage of that faculty member’s compensation is in that course.

He emphasizes THAT is the level analysis needed. Will feels we do not genuinely understand how expensive it has been both in terms of the financial aid awarded to the students to attract them to those programs and in terms of the course load concessions that are made to people in those departments. The fact Will has a position completely dedicated to Business Intelligence was a divergence from others. He was clear and confident in the fact it was priority and shared he pushed hard with his President for the position. He signaled he was aware of institutional challenges and
had clear pathways of how this position would help address efforts on a macro level. His level of enthusiasm and analysis was strategic and given his position in the organization, he was set up for impact and therefore approved the hire – to be run out of IT.

Tara emphasized the role of learning analytics, specifically. In fact, her institution has a policy in the works with faculty senate. Data from their online technology/courses (learning management system) and how that is used is a concern among many faculty. Tara stated: “…no matter how much we talk about using the data to benefit students and most of the changes that we’ve made to the policy…has been around protecting faculty in that policy”. Some examples of how these analytics could help would be looking at how many faculty are using the gradebook, how many faculty are using the learning management system, and what disciplines are using it? Through the interview, I translated that the data could not only improve service for students, but help save time and money. Tara initially hesitated to share exactly what measures and which sources of data could help, but once she started sharing ideas out loud, the ideas spanned. She suggested what she would consider:

I think I would be looking at cost per student, how many sections are we running of certain courses, are they being filled. And this is more sort of just my causal thought process as I look at the academic schedule. But I don’t think we do a lot with ensuring that we make the most use out of our classrooms and facilities.

Sam had other thoughts on how data could help support the academic side of her organization. She mentioned the importance of bringing down home grown systems that take a lot of resources to sustain. She highlights that digital information can be fed into a system, such as a course console, and could help an office figure out how many instructors they need in a
semester. Looking at the whole master plan for an academic semester could help make better financial decisions. She did this work at a previous place of employment and noted that:

Before this, they were really looking at it on a department by department basis. Helping them to think more broadly about how they can approach that has really…it hasn’t reduced the number of people involved in the process, but has certainly improved the process, and I would think that some of the cost savings they are seeing now, or are able to attain, is because they have a better handle on what the needs are and how much they’re spending.

Finally, it is worth noting that two other participants specifically highlighted measures around class sizes, cost to deliver a course, better understanding why people go to their institutions, history of registrations to determine course offerings, high risk students, and so on. The theme of consistent data was a clear priority among all participants.

Conclusion

Related to the research question, when asking about the concept of reducing academic costs, it was interesting to see how broadly people translated those words. It was clear most participants were able to think through what that means on the business side of an institution –the administrative side. For some, including Alex, it was a key business driver. What surfaced were varying definitions or measures of how to identify cost savings opportunities on the academic side, including potential measures such as time or efficiency (which could be defined as the same thing). There were also varying ideas of what to actually measure. The fact that there was such divergence is an important finding. If there is an urgency behind the need for change, the lack of a foundation from which to build an analysis on is a risk and signals just how far behind higher education institutions might be.
There are only a few participants that have an effort prioritized at their institution, yet many see it as a priority – to quote Will “the status quo is not sustainable”. Some participants shared they are not asked to think about those things, where others emphasized the terms alone are not necessarily welcome in higher education. If the status quo is not sustainable, how are we not prioritizing the words? What was also clear among all eight participants is the fact data is a growing and important business trend, with almost everyone agreeing it is important to start prioritizing a strategy around it at their institution. Data is a buzz word that is growing across many fields, including healthcare, non-profits, and business enterprises. In addition, many already have or are building systems that prioritize data to better model, predict, operate, and innovate. Specific to the participants in this study, some saw it as a strategy on the academic side to save, including being able to measure cost/course or demand for programs. Others saw it as a better way to deliver improved services. Either way, everyone identified data and varying measures and applications to help address the research question, making it a superordinate theme.

**Alternative Delivery**

Alternative delivery encompasses the concept that education can be delivered in a variety of different ways, not simply face-to-face. Throughout the interviews in this research study, a broad question was asked at the end of each interview, asking participants to consider what does an education at their institution look like fifteen years from now? Overwhelmingly, almost every participant referenced the word hybrid. The concept of hybrid (blended) is a mixture of both face-to-face and online learning. This is an example of alternative delivery. Related to the research question, other ideas around alternative delivery surfaced, such as online learning, or learning through digital forms. Given that overwhelming outcome, Alternative Delivery was defined as a superordinate theme with online learning and hybrid (blended) learning as subthemes.
Online Learning

It was clear to most of the participants that online learning is a growing, national trend. It is a new way of running the educational business. It is important to note that while many recognize the growth of online, many participants communicated the value and pride they feel in the work their institution does – much of it done face-to-face. With that, several participants realize the need to experiment or consider online as an opportunity in the future, specifically as it relates to the research question for this study. Erin spoke to the fact she felt her organization was falling behind on the academic technology side of the house. She noted it as a weakness from both her perspective and from her board’s perspective. In referencing strategic opportunities for the college, she highlighted the fact that given some restructure with academics and moving academic technologists to IT (positioning IT as strategy), they recently started offering online courses. She states in reference to the recent addition of academic technologists to her team:

And now we’re doing online courses for we’re starting with the alumni right now. Our second online course starts… but part of the point is to learn from that and see how that might help our undergraduate education courses. What can we learn from there that can enhance what we do face-to-face…

When later asked about the research question and cost saving, Erin spoke once again to online, referencing their first four-credit course for undergraduate students was anticipated to run this coming summer. Summer school was emphasized as a way to keep their students with faculty and make money from courses they might take elsewhere. To build on that, Erin states the hope would be some of that effort blending into the regular year. She states: “…the hope is that… once you have the content, well, let’s reuse it.” She concludes with noting that online education has been
proven to be successful and if some of the models could translate into the regular year, that might allow for some flexibility and add value.

Will spoke in detail around an academic program that his team actually helped launch. It was built as an outcome to a strategic task force report, focused on using technical resources around instruction. He notes the program was conceived “to take advantage of those technology and pedagogical resources, at the same time as to take advantage of the high-touch, strong community…”. The program delivers both hybrid and online courses, generates new revenue, keeps revenue in house, and helps keep students on the pathway to graduation. He highlights that now in the fifth year, the program is starting to catch on. An important divergence in his example is the significant role IT is playing in leading the effort. The department helps with the entire life cycle of the program, grounding the technology and pedagogy in line with the entire operations of the program from course selection to enrollment and retention management. This was a very unique example of how IT is doing much more than technology, the department is serving the mission of the institution and “pushing” for innovation.

Joe provided insight into how that cost savings might develop. He emphasized e-learning is a format for how students should learn today – having the experience of taking an online course helps prepare them for the future. He notes lifelong learning as an important necessity. He emphasizes that these students are growing up in a digital world and this is part of who this generation is. He gave very specific ideas of how online learning might support reducing academic costs, suggesting a tier model. He notes that in small, private, liberal arts schools, the portfolio of courses and majors are broad. He proposed the idea of a tiered structure, emphasizing (back to data) a thorough analysis would probably suggest some majors are more profitable than others. If they invested resources into the majors that are profitable and attract student, they can then look
to partnerships or alternative delivery of other courses that might be more cost conscious. He noted:

…if our major portfolio was smaller, and we keep great scholars, tenured faculty members in those departments because you can’t graduate in a major area without someone really deeply invested in it. And then, we have some other colleagues who are valuable but maybe…we just offer some support courses to people who are not majoring in that field but need to learn something about that and we do that a more cost-effective way.

He continued on, emphasizing quite strongly the role of online learning could play a part in the solution. As it relates to mission, he mentions that the solution doesn’t need to mean everything is online, but threading in a few courses that provide opportunities for both students and the institution would be of value. It is important to note he referenced he was getting on his “soap box” with this topic and that there was some hesitation in the idea around the tier model. It took the opportunity, through a question, to think differently – what if this was your job – and that level of vulnerability allowed for a divergent and important idea as it relates to the research question.

Frank was another participant that gave specific examples of how online learning could support the research question at hand. His emphasis, though, was around how the degree is assembled. Similar to Joe, he recognized the generation of students today have different expectations and technology is a significant part of their lives. While recognizing the financial costs to students and the sustainability for both the families and institution, he stated: “it may not mean that everything is taken here. It could mean that there are things taken other places or in different ways or through different channels or though different mechanisms that might not even exist today”. He goes on to discuss online courses and that “we’re doing students a disservice if we don’t expose them to learn in that kind of mode”. He referenced the fact that a specific
recommendation from a financial model task-force was to move some courses online so students could take classes over winter or summer – reducing costs and helping to accelerate the degree. While the actual cost savings details didn’t surface in too much detail, a few noted savings at a high level through less use of facilities, campus resources (heating, A/C, etc.) acceleration, and course caps. New, targeted programs – such as a mini MBA highlighted by Alex, could focus on generating new revenue as well.

**Hybrid (Blended Learning)**

One of the final questions asked to each participant was what does an education at their institution look like in ten to fifteen years. *Every single participant* referenced hybrid learning as a key way future education would be delivered. Some had more specifics as to why they felt that way, while a few others just sensed that was the future model of higher education. Joe was one of the participants that dove into detail as to why hybrid (as it relates to both the broad research question, but also to the vision) is where education is going. Joe noted some challenges around hybrid as it relates to recorded contact hours but emphasized a few key potential benefits to doing hybrid learning and reducing contact hours. He noted: “…we’re actually wrestling right now with academic space, do we have enough. You can imagine that we need more classrooms. We need another academic building in the next campaign”. They are working on analytics on classroom utilization (back to the point on data), but they’re “not surprisingly, we’re like everyone else, it (the schedule) has peak times where everyone wants to teach.” He goes on to speak about the role of partnerships and consortia, which is another theme discussed soon.

Alex also looked to hybrid learning for the future. He shared:

I think it looks slightly different than what we’re doing now in that it will be more tailored, I believe, to an individual. There will be different modes of delivery, although the professor
in the classroom, physically in the class with students engaged in discussion, I think will continue, whether that classroom is virtual or whether that classroom is on online, that’s left to be seen, or whether it’s a mixture.

While he forecasts the brick and mortar will still have a role, like Joe he emphasizes with different modes of delivery, and potentially fewer bodies on campus, the physical plant might shrink, saving money.

Others emphasized hybrid learning due to the potential quality in delivery and the recognition of the digital era in which these students are growing up. Erin noted research “has been saying that online education is effective and you can certainly learn at a high level”. Joe emphasized “we’re doing students a disservice if we don’t expose them to learn in that kind of mode”. He speaks at length to the fact that students are growing up as digital natives. Frank emphasizes that too:

…we’re doing students a disservice if we don’t expose them to that because the reality, you look at what we’re doing now, right? If they don’t because whether they go to work, it could be anything that is the way the world is working now…

It was clear that not only due to some potential financial benefits, a reason for hybrid learning is simply due to the fact technology is so integrated into student’s lives and they will come to expect it.

**Conclusion**

Both online and hybrid learning surfaced in all interviews among participants for a variety of reasons. Even with some variability in the why, it is clear online and blended learning are forms of educational delivery that small, private, liberal arts colleges will need to consider. Some believe it will help save the college money, while others see it more through the lens of service to future
students and families. Several participants recognized and prioritized the fact that this generation of students are growing up with technology in their personal and professional lives. It is important to recognize this reality, as new models of education are delivered in the future.

Also, it is important to understand that the financial models shift in online learning. Institutions need to do the analysis to understand how it could both benefit them, but also consider the strategic reasons why they might want to move into that mode of delivery. In further conversation with Will, his college has worked on an analysis that shows financial benefit to the institution, including: generating new revenue, keeping revenue in house that might have gone elsewhere, accelerating the time to degree completion, keeping students on path to graduation, using online programs as a recruitment tool for new students (including transfers), reducing some overhead in services to deliver the form of education, and so on. These noted benefits signal the position of Will in the organization and the commitment to understanding the institutional benefit at large. Efforts are connected. Institutions looking to engage in this delivery must put the strategic intention and opportunities, along with risks, front and center. In addition, building financial models, among other forms of assessment, is important to measure ongoing impact.

**Consortium**

One of the final superordinate themes that emerged in the research analysis was the concept of consortiums. Consortiums are terms such as partnerships, collaborations, or joint efforts on behalf of several institutions. Over half of the participants noted consortia as something either underway or something they are thinking about as it relates to the research question. While some were a bit more hesitant to dive into shared efforts in academics, noting back-end systems as easier to merge, a few were bold enough to share some “out there” ideas.
when asked about *what if this was your job?* Giving the participants an opportunity to be vulnerable was important.

Will spoke about an interesting effort underway with two other institutions. While he was clear the effort was not related to academics, it was emphasized as a potential opportunity in the future. His institution is working on a shared Enterprise Resource Planning system among three schools. He highlights the three schools have come together to combine systems with the goal of centralizing and improving support and reducing costs. The consortium is a formal consortium, with all three Presidents having support for both the original creation of it and ongoing oversight of efforts. He spoke in follow-up, as it relates to academic opportunities, to an idea where consortia efforts could support partnered institutions sharing courses. Each institution would focus on offering and delivering courses that are core to their mission and strengths while relying on partnered institutions to offer others.

Joe also emphasized the importance of partnerships. When asking about what his institution might look like in ten to fifteen years, he actually referenced the consortium Will shared efforts around. He stated:

I think there’s gonna be more partnerships. I don’t know that I’m gonna go as far as calling them mergers but there may be some…I’m fascinated by it (the consortium). I hope to hell it works because it could be a game changer for many of us.

He goes on to explain some schools may have to partner with others they never thought they would – and figure out the coopetition models. He mostly highlights back-end efforts such as administrative departments or consortia licensing. He emphasizes consortium in the future, stating: “I think were gonna end up with strategic, deeper relationships with likely peers but maybe non-peers that rethink some things we’ve done independently”.
Frank got right to the heart of this idea in his interview. It stemmed from his ideas around looking at data - what the history of registrations has been and the general demand for classes. What does that information say? He challenged the question around: “what does offer mean”? For courses with little demand, he questioned if the course could be brokered through a consortia agreement with another school. These partnerships would pre-exist and he emphasized the classes students take would be the same as taking them at their own institution. In fact, he mentions that some of those considerations are already underway. Analysis is underway, prioritizing a strategy around data to start looking at the operational costs. As he stated, his college is starting to “poke” at these things. Frank is a potential divergence from others in his clarity around the need for timely change. He doesn’t just think it, his college is slowly making it happen. Examples include his job title, focused around CIO and strategic initiatives, and his current efforts and the levels of analysis are underway. Finally, his blunt statement around the fact that “we can’t continue to operate the way we always have”. Sam, also, discussed the idea that his college has “dabbled” in courses across consortiums. She emphasizes there is “opportunity for growth” and everybody has small programs that cost money to run. Online learning/delivery plays an important role in sustaining a potential model around this work.

Alex defines consortia efforts as regional collaborations. Perhaps a spin-off of the term, he emphasized, similar to others that emphasize consortia, the importance of collaboration. He emphasized it as an opportunity early on in the interview in relation to the number of educational institutions in New England. He stated:

I find it’s problematic in that everybody that’s like me has their head sort of looking down in front of them rather than having enough time to pick their head up and be able to see a little bit past the current horizon.
He goes on to mention how he once again thinks collaborations are a big opportunity. When many participants started discussing consortia, it was translated as potentially the boldest, yet potentially most impactful, idea.

Conclusion

It is clear many of the participants realize there are many institutions in New England in current competition with one another. Every participant had similar answers to the questions around what challenges their institution is facing and what it means to receive a quality education there. Given many schools are physically with-in a short radius from one another, some are finding ways to start collaborating on back-end systems and purchasing power, where a few others are considering what it would mean on the academic side. Either way, it surfaced as an important theme that has considerable potential and builds off of initial findings in the literature review. It was also a theme that brought hesitation in the voice of several participants – many realized it would be potentially the boldest of strategies, yet potentially the most impactful as it relates to the research question and sustainability.

Conclusion

The purpose of the study was to understand how Chief Information Officers (Information Technology Leaders) make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges in New England. The analysis of the interview data among eight participants yielded four superordinate themes and eight subthemes. The superordinate themes and subthemes identified were: 1) IT positioned as strategy (1.1 CIO in the structure of the organization, 1.2 partnerships, 1.3 funding models, 1.4 internal reorganization); 2) Data (2.1 defining measures, 2.2 what are we measuring); 3) Alternative Delivery (3.1 online
learning, 3.2 hybrid (blended) learning); 4) Consortium. Superordinate themes and subthemes were identified as those recurring in at least four of the eight participants’ interview data.

The first superordinate theme, focused on how Information Technology (IT) is positioned within the college, was an important finding. In order for the department to make the most opportune and quality impact on the mission of the institution, both how the department is positioned in the institutional organization chart and how the department is funded and prioritizes its resources (including both financial and human resources and the models in which that work is conducted) were important connections to strategy that emerged. Specifically, all participants mentioned reporting structure throughout their interviews. It was clear through participant interviews that not having access to top leadership at the institution, in this case the President, is a barrier, surfacing potential limitations for CIOs, their departments, and how they serve the mission of the organization in an opportune and quality way (strategy). With four participants reporting to the President, the other four noted there would be benefit in doing so. It is worth noting, as it relates to the superordinate and subthemes chart in the beginning of this chapter, that those that the subthemes did not emerge for, are all participants whom do not report to a President. In addition, the role IT plays in adding value as a potential partner was an important finding, highlighted by every participant in this research study. Specifically, how the department uses its resources to serve the mission was important, and CIOs defined a way to do that was through partnering with others on campus. IT was noted by all participants as one of the only departments on campus with insight into how almost every department operates. Partnerships impacted the way CIOs think about and identify their work, make services and projects more value-focused and mission-driven, and help develop a balance between work to support infrastructure versus strategy and innovation. For some, these efforts were even
changing organizational structure and hiring/staffing. In order to best serve the institution, some were considering reorganizations that consider department mergers or new job titles. Being willing and flexible to change was and is important – in some cases, including completely new structures. Finally, the funding models for IT sets the stage for impact and service to mission. Specifically, being both financially supported, but also having a strategy for how and where to spend that money in line with institutional priority, was an important finding. All eight participants noted challenges around either enrollment, discounting, demographics – understanding times are tough. Those reporting directly to a President were able to dive into more detail about some of those challenges, making it clear to this research that an understanding of macro-issues can drive more macro-driven solutions. While most IT organizations have an operational budget (ongoing expenses) and a capital budget (new efforts/initiatives), the balance of funding to support capital/new can be the challenge. When IT is considered more than operational, the funding models can – and should be – balanced towards properly funding new efforts. Only one participant shared they actively establish a budget line item that is completely dedicated to the unknown, allowing for flexible, non-dedicated spending. Emphasized by a participant, leadership at the highest levels need to understand how critical technology infrastructure is for both sustaining and innovating.

Another important finding was the superordinate theme data (data, data…). Every research participant spoke to the power of data as it relates to the research question. There are many ways in which you can define data. In very general terms, the superordinate theme “Data” is defined as how institutions can use available information to make better decisions, and even do some forecasting. It is no surprise data emerged since it is an emerging topic in the technology field at large. It is very different to think about how an organization builds out a data strategy,
specifically what the key reason would be for doing so – making it part of strategy and culture. It was clear there is work to be done around definitions, as it relates to the research question and around the level of analysis. There are a variety of things that could be measured and considered, but who is defining what to measure, why, and how is the institution assuring the information is relevant, current, and accessible? Only one participant dove into a level of detail around data use to measure a very specific cost measurement to the institution on the academic side, and only a few noted significant and committed resources/positions in the organization for doing this work. Other potential measures were more general – understanding demand for programs, for example. It was clear that most of the CIOs could look to the business/administrative operations pretty quickly, but the academic side proved a bit more challenging. The interesting finding is only a few have the effort around reducing academic costs prioritized at their institution, yet most see it as a priority. Some participants shared they are not asked to think about this, where others emphasized the terms alone are not necessarily welcome in higher education. What was clear among all eight participants is the fact data is a growing and an important business trend. Almost everyone agreed it is important to start prioritizing a strategy around it at their institution, helping the institution to make better decisions with data use in mind.

Another superordinate theme, and finding, was focused around alternative delivery. Alternative delivery encompasses the concept education can be delivered in a variety of different ways, most times other than face-to-face. Throughout the interviews in this research study, a broad question was posed at the end of each interview, asking participants to consider what an education at their institution looked like fifteen years from now. Overwhelmingly, almost every participant referenced the word hybrid. The concept of hybrid (blended) is a mixture of both face-to-face and
online learning. This is an example of alternative delivery. Related to the research question, other ideas around alternative delivery surfaced, such as online learning, or learning through digital forms. The emphasis from participants made this a clear, trustworthy finding. Both online and hybrid learning surfaced in all interviews among participants for a variety of reasons, but even with some variability in the why, it is clear online and blended learning are forms of educational delivery that small, private, liberal arts colleges will need to consider. Some believe it will help save the college money, others see it more through the lens of service to future students and families. Whatever the reason might be, it is important to understand that the financial models shift in online delivery and institutions need to do the analysis to understand how it could benefit them, but also the reason why they might want to consider this model of delivering an education. One participant emphasized they have worked on an analysis that shows financial benefit to the institution. This includes not only generating new revenue, but keeping revenue in house that might have gone elsewhere, accelerating the time to degree completion and keep students on path to graduating, using online programs as a recruitment tool for new students including transfers, reducing some overhead in services to deliver the form of education, and so on. It is clear that there might be a benefit to better understanding the models and how it might fit in with the institutional mission at large. Every participant identified hybrid learning as a future delivery model for small, private, liberal arts colleges.

The final finding that emerged, in relation to the research question, was a superordinate theme focused on consortiums. Consortiums encompass the terms partnerships, collaborations, or joint efforts on behalf of several institutions. Over half of the participants noted consortia as something either underway or something they are thinking about in relation to the research question. While some were a bit more hesitant to dive into shared efforts in academics, noting
back-end systems as easier to merge, a few were bold enough to share some “out there” ideas when asked about *what if this was your job*? Throughout this research study, giving the participants an opportunity to be vulnerable was important. It allowed for flexible and new ways of thinking and for things to be shared that might not be “accepted” in the political lens of their position. The important thing will be institutions understanding and knowing what makes their institution unique and different as it relates to mission and being willing to rethink other aspects and what they might be willing to let go of – even when they might not be politically welcomed.

The findings in this research were clear to the researcher before the coding process started. What was fascinating about the flexibility of a semi-constructed interview, and the opportunity for the researcher to be part of the process through the Interpretative Phenomenological Analysis (IPA) research model, was the level of honesty and bluntness through this research. The language changed for some participants when asked to take off their professional hat and consider a new one that was focused around the research question – a chance to be vulnerable and honest. This was supported by the theoretical framework, as well. There was synergy across the answers to questions in general, and the urgency and interest in the topic grew as interviews progressed. There was significant interest in *figuring this out* (the research question). What was probably most interesting, and noted in the researcher’s journal throughout, was almost everyone signaled that the status quo is not sustainable. To quote Will, “the status quo is not sustainable”. Something in the higher education model has to change for institutions to stay open, yet many don’t have a strategy in place for thinking otherwise. If they do, many are hesitant to dive into analysis and change on the academic side of the institution – which is, the heartbeat. Institutions simply cannot continue to nibble at the edges. Significant change is needed in order to sustain the financial model of higher education, and there are ideas for doing so, though the work must be done and guided by
the mission and with potentially new models for doing so. CIOs and their departments can play an important role in that work—providing infrastructure, data, access, services, and ideas—but leadership at large needs to understand the role IT can play and position the organization to make that impact. To quote one participant, as it relates to this research question, “it (the research question) does have a place in higher education, it just can’t continue to operate the way it always has”. It is important to note, once again, that several participants had more detailed answers, or “out there” ideas that might not be traditionally welcomed in to higher education cultures, when they were able to think about the what if question. For a few, they are not being asked to think about it. Then, you question, why are they not thinking about it if most believe that the status quo is not sustainable?

As it relates to trustworthiness in this research, it is interesting to point out how significant the chart highlighting both superordinate and subthemes for all participants is. There were such clear outcomes and connections to these findings and themes for a significant number of participants that there was little doubt in the findings of this research.

Chapter Five: Discussion and Implications for Practice

The purpose of the study was to understand how Chief Information Officers (Information Technology Leaders) make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges in New England. The theoretical framework that guided this research was the Cynefin Framework, an innovative and non-sequential strategic decision-making model. It brings an evolutionary perspective on complex systems characterized with uncertainty. From Kurtz & Snowden (2003), it is concerned with how people perceive and make sense of situations and how that impacts their decision making.
The research method for this work is grounded in an Interpretative Phenomenological Analysis (IPA). The IPA method was chosen for this research to allow for deep, personal reflections aimed at surfacing new themes and ideas for addressing the research question. The work is grounded in experience, not the abstract, and the approach moves beyond phenomenology (participants' accounts) and attempts to report on the participant's experiences by considering the researchers own view of the world (researcher's interpretation). This research method was appropriate for this study, allowing for the researcher to bring forward themes that clearly emerged through analysis between participants, while also including the researcher’s interpretation.

The analysis of the interview data among eight participants yielded four superordinate themes and eight subthemes. The superordinate themes and subthemes identified were: 1) IT positioned as strategy (1.1 CIO in the structure of the organization, 1.2 partnerships, 1.3 funding models, 1.4 internal reorganization); 2) Data (2.1 defining measures, 2.2 what are we measuring); 3) Alternative Delivery (3.1 online learning, 3.2 hybrid (blended) learning); 4) Consortium.

In this final chapter, each of the findings are discussed and situated within the context of the literature to determine whether the findings support or contradict previous research. Following a discussion of the findings, recommendations for practice are discussed. The chapter will conclude by offering recommendations for future research.

**IT Positioned as Strategy**

How Information Technology (IT) is positioned within the college was an important finding through this research. IT positioned as strategy occurs when the department is set up to make the most opportune and quality impact on serving the institutional mission. To accomplish
this, both how the department is positioned in the institutional organization chart and how the department is funded and prioritizes its resources (including both financial and human resources and the models in which that work is conducted) were important connections to strategy that emerged. When aligned, thought through, and connected to the larger institutional mission, the ideas related to the research question were more insightful and encompassing of institutional opportunities and outcomes.

This broad finding falls in line with literature in the field today. Smith & Cohon (2005) identified the unprecedented technological change that has been occurring for the last decade (plus) and the growing complexities. IT organizations are more than just infrastructure. The focus is now becoming more about leveraging infrastructure to support strategy and mission. Dlamini (2015) makes it clear the CIO position is no longer highly focused on technical issues, but has influence on the institution's mission critical strategies, clearly showing that the position has experienced organizational ascension. Many IT departments, and leaders, are being called to do more than just provide infrastructure and support – many are being called to support academic innovation, delivery, and to be partners in supporting institutional initiatives.

The findings in this research study supported some of the current literature, as referenced above, but also provided more insight as it relates to the specific challenges that must be considered for the level of work around serving strategic mission to happen. For CIOs to not be focused solely on technical issues or infrastructure, but truly serve mission critical strategies, specific barriers must be overcome. As noted in the findings, only 50% of participants in this research are positioned within their institutions to have access through reporting structure and organization to the information and funding to play a prioritized role in the overall strategy and mission. Participants who had a varying reporting structure, most directly in line with the
President, had broader insights into the challenges and opportunities facing the college and thoughts related to the research question at hand. They were also very vocal about the benefits and recognized it as a statement of importance. Some of the participants emphasized the importance of being willing to restructure their teams to make this work happen, including merging with other teams in the organization. As noted in the literature review, some institutions have taken steps forward in organizational restructuring. Wenhong (2016) emphasized the inclusion of the CIO in top management teams as an indicator of how the organization prioritizes technology as a strategy in his work. Still there is no consistent reporting structure on a global level. CIOs have had varying reporting structures for some time. From EDCUAUSE (2018), CIOs, for their part, have a wide range of reporting relationships. About a third report to the President or Chancellor (34%), while about a fifth each report to the Provost, the CFO, and the Vice President or Vice Chancellor (20%, 19%, and 17%, respectively).

In addition, funding models and the importance of being both financially supported, but also having a strategy for how and where to spend that money in line with institutional priority, was an important finding. All participants noted similar challenges facing their institutions. Participants emphasized they understood challenges around either enrollment, discounting, demographics, or the challenged value of a liberal arts degree. All worked from a general understanding that times are tough – but it is important to note that some realized that more than others and everyone had a different angle on efforts. Those reporting directly to a President signaled more confidence and were able to speak in more detail about some of those challenges. This perspective falls directly in line with the literature review, which made a strong case that there are significant, increasing pressures on small, private, liberal arts colleges. This is clear through both the financial pressures and demographic challenges – with a direct threat to
colleges in New England. Tuition has risen rapidly, with even more rapid increases in institutional financial aid (Summers, 2004). Since the 2008 recession, many institutions have realized significant impact and pressures on overall revenue sources. Student enrollment has a direct impact on the financial health of an institution and it is predicted to decline through the literature. Specifically, for New England, from Bailey & Hussar (2013) and work published through the National Center for Education Statistics, by 2020 there are expected to be close to 10% fewer high school graduates in New England than there were in 2010. In addition, data from Harney (2011) – as part of the New England Board of Higher Education analysis of U.S. Department of Education data - since 2010, enrollment has slowed down in New England colleges. This trend has created a threat and fierce competition for the potential pool of applicants that so many recruit from. With that in mind, participants still advocated for a consideration and prioritization of funding. Recognizing the challenges, several participants emphasized the importance of funding models that prioritized sustaining infrastructure, yet also supported new, strategic efforts. Some of those efforts to sustain and innovate required the willingness to spend money in order to make/save money, and/or add value.

In line with the understanding of challenges facing small, private, liberal arts colleges, the current literature emphasized the value of the liberal arts degree, yet the fact that it continues to be under scrutiny adds a layer of complexity to how the small, private, liberal arts position themselves. Logan & Curry (2015) emphasize the debate about the effectiveness of the liberal arts curriculum is centuries old and that recent financial and social pressures have placed the survival of the liberal arts in the United States at even greater risk. The most serious threats are the battles of ideology and the shifts in technology (Neely, 1999). We live in a market-driven world, with market forces impacting the role of higher education and the types of students
coming out into the work force. Major external factors include the demographic, economic, and geographic shifts, but market economics are driving specific, job-ready outcomes. Ragan & McMillan (1989) also suggest the pressures that have been challenging the liberal arts for some time. Directly outlined are rising costs, increasing vocationalism, decreasing funds, and fewer students in the 18-22-year-old market. Most participants fell in line with an understanding of these challenges and shifts, but also fell in line with the perspective that there is a strong value for the small, private, liberal arts education. Many of the participants were proud of the work their institutions do. They found value in defining what a quality education looks like that fell most in line with the fact “the place of curricular breadth in liberal education is ultimately a matter of wholeness. For American institutions, it is a key ingredient, along with depth, in preparing a fully educated citizenry capable of thinking critically, troubleshooting creatively, and communicating effectively” (Logan & Curry, 2015, p. 68). While many participants believed in the mission of their institutions, they communicated quite strongly that things must change in order to sustain themselves.

Finally, all eight participants in this research study mentioned the role of partnerships. How the department uses its resources to serve the mission was important and CIOs defined an important way in doing that was through partnering with other offices on campus. IT was noted as one of the departments on campus that had insight into how almost every department operates. In line with the literature, the campus IT organization can become a key partner and facilitate in the process of innovating. From Brown (2014), opportunities lie in becoming actively engaged in the teaching and learning mission of the institution. This is emphasized through more recent reports released through EDUCAUSE. EDUCAUSE is a professional non-profit committed to advancing higher education through IT. The organization published two major reports in 2018,
and the publications focus quite significantly on trends far beyond technology, signaling just how systemic this work is. From Becker, S.A., Brown, M., Dahlstorm, E., Davis, A., DePaul, K., Diaz, V., & Pomerantz, J. (2018), trends such as advancing innovation, rethinking how institutions work, and agile approaches to change are just a few of the topics in review. In addition, EDUCAUSE (2018) focuses on academic transformation as the number one issue/opportunity. For IT teams, the key is not just about being a supportive player, but a proactive change agent that works to enable the institution to construct new ideas and vision. That idea carries well into the next set of findings, which provide specific ideas of how to answer the research question at hand.

**Data**

The concept of data emerged as a significant finding in this research. As previously mentioned, every participant spoke to it in some capacity. For some participants, it was more of an emerging theme versus a few others, but it is important to note all see value in how it would help move the institution forward. There are many ways in which you can define data, but in very general terms, the definition emerged in this study was centered on how institutions can use available information to make better decisions. It is no surprise data was a finding since this is an emerging topic in the technology field at large. It was interesting to see when data emerged as an opportunity for participants, specifically as it relates to the research question, the measurement varied in terms of both cost savings and application/strategy for the best data use. There was no “go to” measurement related to the research question or how anyone in this field might approach it. This was potentially predictable, with the administrative side having more obvious types of measurements. Specific to academics, it was clear while many had ideas that supported or challenged the notion, not many knew where to start.
In current literature, the concept of learning analytics is a growing trend as it relates to higher education and the use of data. Examples, such as the work of Clow (2013), look at data through the lens of information including historic grades, performance, GPA, and demographics. This data could help predict student outcomes and success. Learning analytics did not emerge as a major theme in this research study, but it did with one participant. The research question potentially positioned for alternative analysis among participants. Answers from participants considered measures around the expense side of the organization – such as the cost of faculty or programs. Specifically, what emerged were a variety of ideas around how to define measurements on the academic side for cost, with some participants considering time as a key measure, and others looking to terms such as efficiency, analysis at a cost/course or cost/program level, or around student demand for specific programs or courses. These similar terms emerged throughout literature reviewed in preparation for this study. Carlson (2018) mention some of the terms above, including a key focus on how time on the faculty side is spent and what the curriculum is and how it is being delivered. Mirrlees and Alvi (2014) consider a historical lens on how technology has been suggested as a way to yield new efficiencies in higher education. Suggested is the fact there have been longstanding attempts by United States leadership to apply new communication technologies to educational labor process as a way of making it more “efficient” and can cause fraught power relations between leadership and faculty. From Wei-Chen, Hung, & Jeng Ifeng (2013), the internet is being shaped by technologies where productivity and collaboration are playing key roles in peer interaction. With a huge culture shift focused on productivity, collaboration, and inclusion, there is a transition of expectation into the higher education environment. Many of the participants agreed some of the “dirty words”, or words some prefer not to hear in an educational context, need to be defined in order to address
some of the challenges facing higher education. A few considered it a key business driver.

Literature recommended definitions as well, with Levin (1991) encouraging the importance of defining productivity in the higher education context.

Current literature, outlined in Levin (1991), noted historically, many administrative and financial decisions are made by central administration, but in relation to curriculum, staffing, and instructional decisions are made at a decentralized level (departments, schools, and other units). This signals approaches to improving academic productivity cannot be done without cooperation of decentralized units. This perspective and level of analysis did not carry out as strongly as a finding in this research study. One participant mentioned the concept of a total cost of ownership as a measurement, but referenced that as a more common measurement on the administrative side. Another participant challenged the concept you can identify any measurement you want, but the challenge remains – economies of scale are significantly different in higher education and measurements that might be considered in business environments are not always transferable. Carlson (2018), from a recent publication from The Chronicle, presents an interesting perspective in line with some of the participant findings. Emphasized is the fact many institutions have zero idea of how they make a living – that they really don’t understand how they make money on the academic side, so there are challenges in finding efficiencies.

The fact there was such divergence in measurements and analysis is an important finding for this research study. If there is urgency behind the need for change, the lack of a foundation from which to build an analysis on is a risk and signals just how far behind higher education institutions might be. In addition, there are only a few participants that have the effort prioritized at their institution, yet more than a few see it as a priority. What was also clearly recognized by
participants in this study was data is a growing and an important business trend – literature in many fields from healthcare, to non-profit, to business enterprises - already have or are building systems that prioritize data to better model, predict, operate, and innovate. In both Becker et al (2018) and EDUCAUSE (2018), leveraging data and building a strategy are emerging priorities. Everyone agreed it is important to start prioritizing a strategy around it in higher education.

**Alternative Delivery**

Alternative delivery encompasses the concept that education can be delivered in a variety of different ways, most times other than face-to-face. Throughout the interviews in this research study, a broad question was asked at the end of each interview, asking participants to consider what an education at their institution looked like fifteen years from now. Overwhelmingly, almost every participant referenced the word hybrid. The concept of hybrid (blended) is a mixture of both face-to-face and online learning. This is an example of alternative delivery. Related to the research question, other ideas around alternative delivery surfaced, such as online learning, or learning through digital forms. Technology has had a historical and proven impact on many industries, but the impact on higher education continues to rapidly expand. There is considerable literature around the expansion and impact of blended and online learning specifically, and the literature references data points that show just how dominant online learning is becoming. The Online Learning Consortium (2016), referenced as OLC, is an organization made up of hundreds of institutions and corporations, in over fourteen countries, dedicated toward advancing best practices in online learning. In a recent infographic put out by the organization, they note seeing a 263% increase in online education over the last twelve years. Today’s learners are dynamic, a mix of traditional and non-traditional, with 90% believing online education is comparative or better than traditional forms of education. It was no surprise
that new models of education, including blended and online, are growing at significant rates nationally. Both online and hybrid learning surfaced in all interviews among participants for a variety of reasons, but even with some variability in the why, it is clear that online and blended learning are forms of educational delivery that small, private, liberal arts colleges will need to consider. Some believe it will help save the college money, others see it more through the lens of service to future students and families. Several participants recognized and prioritized the fact this generation of students are growing up with technology in their personal and professional lives. This consideration of priority matches some of the current literature in the field, including recently documented data from the OLC (2016) that states 77% of institutions offering online learning say it is key solution to their long-term strategy. It is predicted by fall of 2018, 48% of teaching materials will be digital, supporting a blended and/or online delivery.

Ying-Hsiu & Tourtellot (2011) state that implementing blended, accelerated learning programs (or courses) requires a systematic approach, not just the addition of new technologies. Adding an additional function requires additional resources, time, and strategy. Specifically, for small colleges, many face challenges with a movement towards blended learning because of already-constrained resources. These findings correlated with some of the participants’ stories through this research study. For many, a major challenge was governance or the institutional priority to grow these programs. This was due to a variety of reasons, with some having stronger programs than others. While some institutions had just a few courses being delivered online, a few other schools were building larger programs, with one specifically focusing on incentivizing faculty and trying to increase the percentage of full-time faculty that participate. In line with the research, it was built into strategy and time and resources were considered. This was not the case for many in the research study. In addition, from the Online Learning Consortium (2016),
85% of faculty report having little experience teaching with digital learning materials. Simpson (2010) considers this through the lens of rewards for faculty. As these new mediums become strategy and mission for an institution, without significant rewards and governance, recruiting and sustaining quality faculty might prove challenging. Significant faculty development, as well, must be considered and investments must be made to assure quality.

Some of the findings in this research signaled challenges around knowing what to measure in order to target the research question around reducing academic costs. The financial models shift in online learning and institutions need to do the analysis to understand how it could benefit them. A few participants referenced this work being done in this area, including one analysis that shows financial benefit to the institution through: generating new revenue, keeping revenue in house that might have gone elsewhere, accelerating the time to degree completion, keeping students on path to graduating, using online programs as a recruitment tool for new students (including transfers), and reducing some overhead in services to deliver the form of education. Others considered it because of potential savings through less use of facilities, campus resources (heating, A/C, etc.), acceleration, and potentially edits to course caps. Some of the research being done in the field signals a consideration of these forms of delivery in order to meet some of those financial goals, but much of the literature notes the challenges in higher education governance and culture in identifying just that. This correlated with findings in this study that while some looked to the cost benefit side of potentially delivering an education differently, more tended to reference it was a trend due to the impact technology is having on the current generation. Many predict blended as a key form of delivery due to the digital era and future skills needed, but also due to the growth of digital materials. Digital materials are growing rapidly. Billions of dollars are being invested into higher education through technology
start-ups. From Straumsheim (2015), $2.51 billion was invested in educational-technology companies during the first half of 2015. Publishers are shifting their business models to become technology companies as well. These technologies can be used in a variety of learning environments, but are also being designed to challenge or enhance some of the more traditional forms of learning.

**Consortium**

One of the final major findings that emerged from the research study was the concept of consortiums. Consortiums include partnerships, collaborations, or joint efforts on behalf of several institutions. Over half of the participants in this study noted consortia as something either underway or something they are thinking about as it relates to the research question. Some participants spoke to the benefits and opportunities for improved services or cost savings on the administrative side, with one participant highlighting a project underway between three schools to integrate back-end software systems to support the business side of the college. As a massive project and commitment, it is clear that not many others are committing in a way that some might consider wed the institutions in a big way. Other participants started with the business side of their institution as an opportunity to consider consortia, but the academic side did not come as quickly in conversation. From Neal (1984), consortiums have been considered, for some time, as an opportunity to build bridges to create flexibility, expanded resources, and find some efficiencies. Much of the literature emphasized the benefits, but while the concepts and partnerships have been considered in other sectors for some time, consideration in higher education (especially the small, private, liberal arts) is still fairly new. From Becker et al (2018), cross-institution and cross-sector collaboration is considered a major trend as higher education
looks out over the next five years. Some of these efforts include shared data efforts, or shared/merged resources, for example.

As mentioned above, the concept of consortia as an opportunity in academics came not as a first thought to many of the participants. The concept emerged a bit more when participants were given a scenario to consider if their professional role was focused on reducing academic costs through integration of technology. One participant referenced it as a potential next step with an already established consortium, some referenced simply an increase in partnerships or regional collaborations, and a few considered a scenario around a group of schools that might teach courses unique to them and partner with the others to deliver the courses that are not. Arguably the most aggressive thinking, as it relates to the study and consideration of ideas, was a theme around committed relationships that potentially make an institution look different than they do today. The perspective around “outsourcing” specific courses would do just that – make an institution look quite different.

These findings correlate with research considered in preparation for this study. In Bai & Smith (2010), there are examples from institutions who have created shared modules/course content that are used at several campuses, allowing students to choose their delivery preference. Larger, collaborative examples, such as the work of Council of Independent Colleges (CIC), are also growing. In 2015, a small group of colleges experimented with designing online, high-level humanities courses. Member schools were able to offer all 43 courses in their catalog, expanding their overall offerings without increasing overhead. Some highlighted outcomes from Alexander (2016) include:

- “In the second year of the program, instructors spent less time in planning and delivering the course. All faculty felt more comfortable with online learning pedagogy;
- Students had positive learning outcomes in these courses, and faculty and peer assessors ranked student outcomes favorably;
- Although there were no face-to-face instantiations of these online courses, both faculty and students rated the online courses as comparable.”

A few participants actually referenced CIC in their answers. What some might consider a bold way of thinking in higher education right now, a few participants felt this way of thinking might be an important way in which we create more sustainable models for both colleges and families.

In conclusion, it is clear several of the participants realize there are many institutions in New England in current competition with one another. Findings in this study signaled an awareness to challenges and pressures around enrollment, competition, shifting demographics, and other macro issues for small, private, liberal arts colleges in New England. The literature strongly emphasized that as well. Given many schools are in a short radius from one another, some are finding ways to start collaborating on back-end systems and purchasing power, where a few others are considering what it would mean on the academic operations. Either way, it surfaced as an important finding that has considerable potential. It was also a finding that brought hesitation in the voice of several participants – many realized it would be potentially the boldest of strategies, yet also the most impactful as it relates to the research question and sustainability.

**Conclusion**

The purpose of the study was to understand how Chief Information Officers (Information Technology Leaders) make sense of integrating technology as a strategy for reducing academic costs in small, private, liberal arts colleges in New England. As earlier mentioned, this research
was an Interpretative Phenomenological Analysis (IPA) study. An IPA study centers on capturing the lived experience of participants through an analysis process in which the researcher's perceptions about the participant’s experiences are part of the reporting of the findings. The researcher is recognized within the research and the analytic process, and the researcher is trying to make sense of experiences and interpretations, informed by own beliefs. Because this method was used, what made the findings in this research unique was how the literature, themes from participants, and the researcher’s translation and role in the study all fused together.

Upon coding and determining themes in the analysis stage, it was immediately clear to the researcher what the major findings were – and they lined up with informed literature and the researcher, as recognized in the research. The research question proved challenging for some participants, but given the IPA method used, including a semi-constructed interview outline, it allowed for the questions to be asked in a way that was supported in the theoretical framework. Participants in this research study moved between domains as it relates to different responses to questions and ideas to address the research question. Different topics called for different forms of management, tools, practices, and conceptual understandings. There were parts of these findings where participants were very clear in their understanding, perspectives, and other areas in facing moments of chaos or uncertainty. Giving participants the opportunity to move between realities, share stories of experience, and/or think through “what if” or “what could be”, was important to surface findings to support the research question.

Literature emphasized the shifting roles of Information Technology departments in the higher education organization, the growing role of data and analysis, and the exponentially growing trend and impact online learning and alternative delivery is having. The literature
review put these topics front and center and they all emerged as findings in some form as well. Consortums, while a bit more limited in relation to their role in academic settings, surfaced in the literature and was a topic participants translated as potentially the boldest opportunity for higher education to address current challenges and opportunities. What was clear from the findings, and is clear as one considers recommendations for practice and ongoing research, is the sound evidence that higher education institutions face significant challenges and must consider their business model and how it might change in the future. In order for the small, private, liberal arts colleges to remain fiscally healthy, the financial models in which they execute and carry out their mission and work must be examined. It might prove hard to many, given it requires more of a business mind-set, but there are ways to potentially address the financial challenges, specifically on the academic side, and still hold onto identity and the uniqueness of being an educational enterprise. Participants believed in their mission and their service to students. They believed their institutions were delivering a quality education that benefited both students and society. That work can still continue, but might look different. The examples and findings that surfaced through both the literature and this research study share that this work won’t be easy, there will be barriers and challenges, but there seems to be some clear opportunities to implement that will benefit the institution financially and still work to sustain a quality education grounded in mission.

In conclusion, in referencing the theoretical framework, as previously mentioned, the framework was crucial in forcing the participants into new domains to address the research question. While it might be comfortable for participants to operate in the known (simple)/knowable (complicated), when pushed into the complex/chaos, important ideas that contributed to the research question surfaced. The reality is higher education is facing a complex
and chaotic state and is forcing new models and ways of doing things. It challenges us to consider solutions that might not come from a comfortable position/state. Looking to what peers are doing or the concept of best practices might not be the answer. Operating in the complex or chaotic state might mean writing the book and taking new risks never taken in order to stay open, relevant, and hopefully thrive. Finally, if higher education, and its leaders and people, dive into the disorder domain of the framework, it might translate to institutions closing. If there is not already a willingness to be operating in the complex or chaotic domain, it could be almost impossible to move from a disorder state to one that is stable and predictable once again. Disorder is not a domain higher education should strive to operate in, but without change, it could happen.

**Recommendations for Practice**

When translating the findings from this research into practice, there are a few recommendations for successful consideration. First, it is important to understand the history of the institution at large, including the culture, and to be informed about the challenges, pressures, and opportunities the college faces on a global scale. As noted in the findings, when individuals have access to broad, macro information, they will be better informed to assess needs and make recommendations. As it relates to Information Technology (IT), understanding the positioning of IT in the organization is important. Looking at historical projects, reporting structures, budgets, and other context would help tell a story to how IT has been positioned in the past. When advocating for changes to reporting structure, the budgeting process, or in other areas of positioning IT as a strategy (as it relates to the findings), it is recommended a clear story is developed as to why those changes are being recommended. It would be important to paint a picture grounded in research, evidence, and best practices. It is likely that leadership would like
to understand models from other institutions and the value-add of having IT positioned as a strategy as it relates to current, strategic priorities.

Building a data strategy doesn’t happen overnight. Similar to above, it is recommended there is a clear understanding of history in process and priority, but there is also a clear understanding as to how and why an institution would want to engage in an overall data strategy. It would be recommended that an institution seek professionals in the field who understand data and the concept of business intelligence. An example organization might be EDUCAUSE, specifically the EDUCAUSE Center for Analysis and Research (ECAR). Many professionals in higher education IT seek EDUCAUSE and ECAR as a space for personal and collaborative development. Consultants can also be met via this group. There are many other professional organizations/communities, for example users of specific software such as tableau (analytic platform), that would be an equally appropriate resource. Many of these communities are committed to better analysis and the use of data through professional development and awareness in trends. Either partnering with or learning from others, engaging consultants, or hiring someone with this skill set and experience might be of tremendous value. While some colleagues might know math and how to piece together data points, someone who can look at data with a critical lens and help to tell a story would be an important advocate. The data is the easy part - how data is fed and into what systems, how those systems are connected, and how those tools produce reports and information is crucial. Important, as well, is in knowing how to translate those reports and information. What story is that information telling you? As grounded in the findings, many don’t know what levels of analysis are needed to address certain concerns – in this case it proved challenging as it relates to the research question. It might not be an individual, but a collaborative effort to outline needs and opportunities to measure before diving
into data points. Determining what challenges are trying to be solved, and considering what measurements or levels of analysis will help identify opportunities or solutions.

As noted in the literature, online learning is growing at a significant rate. It is clear most institutions cannot turn their heads to a new era of online learning. While not every institution has to engage in online learning, it is recommended for institutions to consider if it might play a role currently, or in the future. There are broad research studies, peer models, and professional organizations that are helping to support alternative delivery and online learning. One example is the Online Learning Consortium, an organization committed to advancing quality online learning through professional development, research, and community. Given how fast this is growing nationally and internationally, any organization considering to pilot, or build a full strategy around online, must work to understand the role alternative delivery will play in their organization. Understanding what courses or programs, the structures, enrollment goals, development models, and the overall strategy would be important. There are many resources to help build that strategy, including professional conferences and collaborations. Participants in this study were at varying stages with their consideration of online and alternative delivery. It was clear there are opportunities as it relates to the small, private, liberal arts colleges, and many predict it will be the wave of the future in some form. It is recommended that an institution understand their story and ground the strategy around this new endeavor in mission and vision for the organization.

Finally, consortiums are a finding that have potentially the largest impact and opportunity. While most participants hesitated, it was the finding that surfaced when given the opportunity to dream big. It is highly recommended that consortiums and collaborations be grounded in leadership support. While professionals can get in a room and talk, the broader
strategy has to be a priority that is thought through. For this work to have true impact on the organization, there must be a clear understanding of institutional priority and mission, and where collaboration and partnership can happen that doesn’t go against this. Understanding where consortiums can help your organization, having leadership to support and help set vision, and then having clear roles of governance around it would be important. There are significant efforts that would have to be prioritized as it relates to political challenge and faculty governance. Higher education organizations are unique in their governance models, and clear structures must be set up in order to help potential bridges be made. There are a variety of consortiums one might research, but specific to New England, one might want to consider researching the Green Mountain Higher Education Consortium or the New York Six to start.

**Recommendations for Future Research**

There are many opportunities for future studies around this research question and research topic. From the findings that surfaced, continuing to understand how Information Technology (IT) departments fit into organizational charts and in reporting structure is and will continue to be important. The resources/staffing would help tell a broader story to how IT is perceived in higher education. Continuing to understand the potential importance or opportunity of having IT report to top leadership, how they are funded, and the general structures of their team and resources would be helpful to those that are looking to understand how IT can have the most opportune impact.

There is also tremendous opportunity in the research field for understanding data analysis and use in higher education on the academic operations. First and foremost, understanding varying levels of analysis and opportunities to measure is important. Many institutions struggle to understand how they make money, and where they lose money. While potentially easily
identified on a macro level, it is clear that it is not common to look at those revenue/cost structures at a micro level on the course or program level. Models that can be researched and potentially applied that do consider a variety of factors, including size of institution, curriculum, and private versus public, would be important. In addition, research could be expanded on where and how that work is carried out in higher education organizations.

If considering alternative delivery, more pilots and research studies could be conducted on blended and online delivery in the small, private, liberal arts colleges. Better understanding the student experience, the cost structures to the institution and families, and the overall outcomes would help others to see opportunity (or not). A model that considers curriculum impact and opportunity as an institution thinks about what courses or programs to put online could be helpful to those looking to build a strategy as well. Where does one start with an online program – depending on curriculum, size, and resources - what might make the most sense?

Finally, to conclude there is tremendous opportunity around consortia for further research. It is clear many correlate the opportunity on the business side of a higher education institution. It can be a bold and scary move for a higher education organization to partner up with others around academic efforts. While some are doing it successfully, many see it as an immediate threat. Better researching current consortia that work and understanding what is being shared and how individual institutions remain unique would be important. Looking at the financial impact of those partnerships, as well, would prove valuable. Any research that can help build an overall vision of how a consortium might work on the academic side – the good and the bad – might provide a helpful framework for more institutions to adopt. The challenges aren’t going away - it now seems to be about what opportunities are most impactful and make the most
sense to be sure small, private, liberal arts colleges in New England stay alive and even thrive. They have an important role in our society and in the future for many young adults to come.
References


ARTICLE: The legal implications of online universities. (2002).


Leaders’ Perceptions of Online and Blended Learning. *Online Learning, 20*(3).


Online Learning Consortium. (nd.). *2016 Higher Education Online Learning Landscape*. 
Retrieved from http://onlinelearningconsortium.org/wp

content/uploads/2016/04/OLC2016ONLINELEARNINGIMPERATIVEINFOGRAPHI.pdf


methods. *Qualitative Inquiry*. 1-11.


Simpson, C. M. (2010). Examining the Relationship between Institutional Mission and Faculty Reward for Teaching via Distance. *Online Journal Of Distance Learning Administration*, 13(1),


Wei-Chen, Hung, and Jeng Ifeng. 2013. "Factors influencing future educational technologists' intentions to participate in online teaching." *British Journal Of Educational Technology*


