

INVESTIGATION OF THE SELECTION, IMPLEMENTATION, AND
SUPPORT OF ONLINE LEARNING TOOLS IN HIGHER EDUCATION

by

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ABSTRACT

INVESTIGATION OF THE SELECTION, IMPLEMENTATION, AND SUPPORT OF ONLINE LEARNING TOOLS IN HIGHER EDUCATION

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The array of online learning platforms and tools for institutes of higher educators to choose from as they assemble their online learning environments is ever growing; however, the selection of tools is a process for which there is no one-size-fits-all solution. Choosing the platform and tools that best support online learning approaches can be difficult and influenced by many factors, including pedagogical, cost, security, privacy requirements, ease of use, and other concerns. This mixed methods study examines what decision makers in online education consider as they select the learning platforms and tools. A review of literature on teaching and learning approaches, social and collaborative learning, faculty and administrative concerns, and online tools informed the survey and follow-up questions used in the data collection, and a group of 30 decision makers were surveyed and 5 subsequently selected for follow-up interviews. Based on the survey findings, and bolstered by the interview data, the study found that the most important factors in selecting platforms and tools for an online learning are ones linked with leadership and governance approaches, as well as personal experience. Insights gained from this study may be helpful in guiding administrators during the process of selecting online tools as well as considering the process in which they are selected.

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Chapter I

INTRODUCTION

Background

The Internet has had a rapid impact on our daily lives. From simple routines of shopping and banking, to receiving and reacting to news, to engaging socially, and even to how we educate, its imprint is everywhere. This transformation is certainly evident in post-secondary education in the development of online education. Computer-mediated communication tools that take advantage of near-instant access to vast repositories of data and knowledge are giving learners the ways and means to interact with information, and each other, across time and space like never before.

One area where the promises and perils of the Internet can be seen is in higher education, which is a space where great leeway exists to explore new techniques, and take advantage of new methods, to reach students (Hanna, 1998). There are many compelling reasons for higher education institutions to embrace online learning, including bringing in new revenue and reaching more students, including ones who may not be able to attend in the traditional way (Bell & Federman, 2013).

While this portends to be an exciting time in online education, with a rapid growth in online and distance learning (Allen & Seaman, 2011), there is also a great deal of uncertainty within the approaches used to facilitate online courses and degrees (Boling, Hough, Krinsky, Saleem, & Stevens, 2012). The ability to bring learning online has been facilitated by the widespread adoption of Learning Management Systems (LMS) and

other online tools that assist educators in arranging learning materials and conducting courses online.

Often these tools mimic traditional class and semester structures found in higher education (McLoughlin & Lee, 2007) with virtual classroom metaphors, and lecture- and discussion-based approaches. More recent phenomena like the Massive Open Online Courses (MOOC) are taking content and courses once exclusively offered through college degree and certificate programs and making them widely available to anyone with a broadband Internet connection, but not necessarily within a classroom structure of any sort (Daniel, 2012).

Frameworks and models that have been developed for online learning that take into account the various aspects of the whole, including how the learners interact with instructional materials (Hirumi, 2002), how student collaborate in online problem-based learning (McConnell, 2006) and cogenerate knowledge (Bruns, 2009; Scardamalia, 2002), and ways in which educators can take advantage of the extensive access to information (Bonk, 2009; Hase & Kenyon, 2000). Additionally, research has been conducted into the pedagogical effectiveness of tool and learning platforms (Heilesen, 2010; Mbuva, 2015; Revere & Kovach, 2011), but there seems to be a gap in the research on how decision-makers in higher education institutions are selecting and implementing online learning tools.

Thus, this study focuses on how online learning platforms and tools are selected and implemented by the people who are developing and managing online educational programs at colleges and universities. From a philosophical standpoint, this study draws heavily from social learning and adult learning theories as a basis for its inquiry. Educators and theorists have noted how online learning benefits from strong teaching and learning philosophies, and the tools and techniques for teaching and learning online must be aligned with a philosophy in order to be successful (Kanuka, 2008). For 21st century

learners, whose ability to access information is exponentially greater than that of learners in the past, the tools and techniques required to teach and learn should match.

Educators Axel Bruns and Dave McConnell have presented two frameworks that take a forward thinking approach to teaching and learning. Bruns (2009) lays out a framework under his term of “produsage,” an approach to teaching and learning he has coined that builds on a skill set inherent to collaborating and creating in the Web 2.0 environment. McConnell (2006) describes an approach to “distributed problem-based learning” that takes into consideration the affordances of the Internet and the limitations of the technology alone being able to organize and support learners. Drawing from these frameworks, it becomes clearer that the needs for online learners are served best by social and collaborative learning approaches, and in terms of the tools, they really only become assets to learning as the learners use them together.

The tools that are considered important and selected should be the ones that support creating such an online learning environment. One focus of this study is investigating the tool types and teaching and learning approaches that fit the types of activities that Bruns (2009) suggests in terms of collaborative knowledge creation and non-hierarchical learning environments. The other focus is examining such factors as cost, privacy concerns, and usability and how they can impact tool selection.

Following a literature review that addresses the teaching and learning methods, online tools, and related issues that impact online learning, a mixed-methods inquiry with decision-makers in online programs across various public and private non-profit colleges and universities explores questions of what tools they use and why they have chosen them for their institutions. Thus, at the heart of this study is the idea that the learning tools and the learning approaches together help in defining the online learning space or, in a sense, classroom.

Stephen Downes (2005) provides a helpful definition of the learning management:

The dominant learning technology employed today is a type of system that organizes and delivers online courses—the learning management system (LMS). This piece of software has become almost ubiquitous in the learning environment; companies such as WebCT, Blackboard, and Desire2Learn have installed products at thousands of universities and colleges and are used by tens of thousands of instructors and students. The learning management system takes learning content and organizes it in a standard way, as a course divided into modules and lessons, supported with quizzes, tests and discussions, and in many systems today, integrated into the college or university's student information system. (p. 1)

Throughout, this study uses the term “Learning Management System” (LMS) to mean a learning platform as the online environment in which students and instructors interact, while an online “tool” refers to either the individual capabilities within the LMS, like forums and wikis, or applications that are available external to the LMS, like Google Drive or VoiceThread.

Although not all LMS systems are created exactly the same, they typically include at least a basic set of tools that are important to educators in creating and supporting the environment used for conducting classes. It is through the lens of the tools that this study examines the role of learning approaches, among many other factors, on how decision-makers select and implement online tools.

This study uses a mixed-methods design to explore these factors. Through an online survey, a broad set of information was collected on the participants, including their background, online teaching history, program history, preferred teaching and learning approaches, and online tool preferences. Then, following a purposeful selection of five participants, personal interviews were conducted to further the stories behind what drives their decision-making.

By examining the alignment of teaching and learning approaches and tool selection, and identifying the factors that seem to be the most influential in the selection of the tools, it may become possible to identify the strengths and flaws in current

practices, which could potentially assist decision-makers when making future online tool selections.

Statement of the Problem

The selection of tools for delivering online courses in higher educational institutions is recognized as a process for which there is no one-size-fits-all solution (Anderson, 2008). Additionally, a review of literature regarding online tools and teaching methods reveals a broad range of questions and concerns on the pedagogical approaches involved in implementing online learning. A large number of online tools are available for educators to pick and choose from to assemble an online learning environment, but developing a consensus on how to select the platform and tools that best support online learning approaches can be difficult, and researchers have indicated that the approach to teaching, and the tools used, should be also be linked to educational philosophies (Kanuka, 2008; Meier, 2015). Highlighted by a growing demand for online learning (Allen & Seaman, 2011), online tool selection is worth investigating because it seems that much current online teaching and learning is still centered on traditional approaches like reading texts and lecturing (McLoughlin & Lee, 2007) or in large-scale video-based MOOCs that offer few structured interactions between learners and instructors (Daniel, 2012).

Arguments have been made in the educational technology field that the best types of activities for teaching and learning online are rooted in social and collaborative learning practices (Brown, Collins, & Duguid, 1989; Jonassen, 1998; Lave & Wenger, 1991; Schank, 1996; Spiro, Feltovich, Jacobson, & Coulson, 1992). Social learning approaches and activities implemented within classrooms could suggest the types of online tools that are used to facilitate online instruction. In fact, if one looks at the use of the web beyond the education sphere, one sees the widespread availability and adoption

of collaborative and social media tools, inherent in applications born in the Web 2.0 web era (2005-present), like Wikipedia and Facebook. Additionally, literature on adult learning, including andragogy (Knowles, 1973) and Heutagogy (Hase & Kenyon, 2000), suggests that a more connected and collaborative approach to online learning is possible. However, it is not clear if current practices result in the selection and implementation of the tools that facilitate such social and collaborative learning approaches, or if indeed that is how decision-makers feel online learning is best approached.

The LMS that have been developed for schools to manage online learning have been criticized as being over-restrictive, modeled on traditional face-to-face educational approaches, and inadequate for internet connected learning (Downes, 2005; McLoughlin & Lee, 2007; Watters, 2014). At the same time, concern has been cast upon using tools outside the LMS and colleges' ecosystem for support, privacy, and regulatory reasons (Bates, 2005; Oliver, 2007). Additionally, online learning environments may sometimes be implemented for reasons of achieving scale and/or wider visibility (Bell & Federman, 2013). For example, a recent development in online learning has been the rise of the Massive Open Online Courses (MOOCs) and their rapid adoption by mainstream colleges and universities. Whether seen as a panacea for the woes of higher education (for example, non-traditional students, rising costs of college, lack of space and adequate facilities) or a stake in the traditional universities' heart, MOOCs (at this point) tend to be lecture-driven courses with enrollments that can theoretically reach into the thousands. However, with scalability, the complications of nurturing nuanced social and peer interactions grow, as does the challenge of asking students to be self-directed and determined in their learning (Bouchard, 2011; Kop, Fournier, & Mak, 2011).

One way in which to explore the factors that shape the decisions made when selecting tools for higher education's online learning efforts is through the experiences of the decision-makers: examining what influences them, their experiences, their tool choices, and what they feel is working for their programs. In the course of this study,

participants were asked what the online learning tools are that they are adopting at their institutions, what factors influence their decisions in selecting these tools, and what role their teaching and learning preferences play. This inquiry explores the concerns, considerations, and compromises that are made during the selection process, and how factors such as teaching and learning philosophies impact tool selection.

Purpose of the Study

The purpose of this study is to investigate the thinking behind current trends in the selection of online learning tools in higher education. Utilizing an online survey and follow-up interviews, a combination of qualitative and quantitative data has been collected and analyzed, providing a window into the experience of choosing online learning tools.

A review of national and international literature, including adult learning styles, online collaborative tools, social learning theories, and faculty concerns, informed the development of the survey and set of interview questions. The subsequent analysis of the survey data and interview responses has helped to tease out some of the factors, challenges, and trends that educators face in the selection and implementation of online learning tools at their institutions. Additionally, the researcher was interested in examining the role that personal teaching philosophies play in the selection of the tools, and if in fact tools are being selected that support preferred teaching and learning approaches.

Ultimately, through this set of surveys and interviews with leaders in the field, the data can provide some insight into the factors that impact tool selection. The results may be helpful in guiding administrators in the selection of online tools to support the activities and needs of adult online learners.

Research Questions

The following questions have guided this study in its attempt to develop an understanding of the factors that influence leaders of online programs in higher education when selecting tools to support online learning efforts. They are:

- How does the decision-maker's perspective on teaching and learning approaches impact how online tools and platforms are selected?
- How do the decision-makers weigh budgetary, technical, pedagogical, and user support concerns when selecting online tools and platforms?
- What online tools (i.e., blogs, wikis, discussion forums) and course management systems (i.e., Blackboard, Moodle, Sakai) are the decision-makers in the online education programs of higher education implementing at their institutions and why?
- Do the tools and platforms that institutions have selected adequately support the decision-makers' desired learning environments?

Following the direction set by these questions, the goal of the study was to develop a rich picture to aid in understanding how online platform and tools are selected and implemented to support online learning programs, examine the implications of this for online learning more generally, and suggest directions for its future development.

Significance of the Study

Through a mixed-methods approach, this study aimed to develop an understanding of the factors, influence, and perspectives that impact administrators in the selection and implementation of learning management systems and tools for supporting online education programs. With an estimated 6.1 million college and graduate students taking at least one online course, and little sign of decline over the coming years (Allen & Seaman, 2011), it is both timely and informative to educators developing new programs

or rethinking current ones to have an understanding of the tools, methods, and approaches that are currently being offered in peer institutions.

The following literature review explores the types of teaching and learning that have been seen as effective in online settings, combined with a review of approaches to adult education and group learning, with a focus on the capabilities of web-based collaborative tools.

Epoche

Before embarking on this study, the “Epoche” is a place in qualitative research for the researcher to examine to present “their own experiences and the context and situations that have influenced their experiences” (Creswell, 2014, p. 82). This section allows the research to surface his/her own feelings and opinions and to become more objective in the subsequent study. Here is my own “Epoche”:

Between 1996 and 2014, I participated in many online courses, both for professional development purposes and for my academic studies. I also had the opportunity to teach higher education courses both asynchronously and synchronously online, and since I began teaching college level courses in 2001, I have consistently used an LMS to support my courses.

My experiences in teaching and learning have been at times rewarding, yet also often disappointing. The disappointing courses were the ones that perhaps tried, but ultimately didn’t succeed, in creating engaging social learning environments, and the most interesting were the ones that did. However, I also took a course that used an emerging online tool (Google Earth), and though the course was not socially oriented, the activities and tool itself were quite exciting. There was also a course that I took toward the end of my studies that melded both social engagement and online tool use in a meaningful way, and I found the experience very fulfilling.

In my professional life, I have managed the website of a higher education institution and experienced administering a school-wide platform for users who range from students to staff to faculty with technical experience that runs the gamut from Luddite to IT Guru. I feel that I have gained a deep insight into the frustrations of managing IT infrastructure and trying to balance it with user needs and training. As an instructor, I have found the use of various LMS to be often similar, typically adequate, but also rather rigid in the options available for presenting content.

Thus, my interest in the topic of online tool selection is fueled by both my desire to understand what best practices are in selecting tools for online learning, and how the capacity of tools can be harnessed to foster excitement and engagement in learning. These experiences—academic and professional—shaped the areas of my literature review and thus the construction of my survey, and I tried to be simply curious and objective as I conducted the interviews for the study.

Chapter II

LITERATURE REVIEW

Learning Online

In 2005, Tom O'Reilly coined the phrase "Web 2.0" to define what he saw then as an emerging paradigm in the development of the World Wide Web. The older model of interactions on the web relied on broadcasting content, but Web 2.0 was about trusting the "wisdom of the crowds" to provide useful information (p. 6). The Web was no longer stuck in a read-only mode; rather, its users could influence and provide the data. The net effect was that Web 2.0 sites are ones that grow in importance and functionality the more people contribute to them.

To illustrate the difference between the paradigms of Web 1.0 and Web 2.0, O'Reilly (2005) offers a comparison between the online retailers of Barnes and Noble and Amazon. Both companies sell the same products and receive the same product information, such as images, descriptions, and other content from their suppliers, but one company's approach embraces the Web 2.0 paradigm:

Amazon has made a science of user engagement. They have an order of magnitude more user reviews, invitations to participate in varied ways on virtually every page—and even more importantly, they use user activity to produce better search results. While a Barnesandnoble.com search is likely to lead with the company's own products, or sponsored results, Amazon always leads with "most popular," a real-time computation based not only on sales but other factors that Amazon insiders call the "flow" around products. (p. 6)

Thus, by definition, the true value of a Web 2.0 experience is one that builds on the social construction of data, rather than just information flowing in one direction. In fact, this distinction suggests the idea that “the central principle behind the success of the giants born in the Web 1.0 era who have survived to lead the Web 2.0 era appears to be this, that they have embraced the power of the web to harness collective intelligence” (p. 2).

The number of people collaborating, connecting, and communicating in Web 2.0 environments is growing (Thompson, 2007). For example, Facebook, a Web 2.0 site devoted to social networking launched in 2004, reports having over 400 million active users as of February 2010 (Facebook.com, 2010). According to Ellison, Steinfield, and Lampe (2007), Facebook users will spend on average 20 minutes a day connecting with friends and acquaintances online, sharing photos and comments, and keeping up with each other and participating in group activities. The power of an online social tool like Facebook is not lost on education researchers. Recent studies have looked into issues such a privacy, self-disclosure, and social capital (Ellison et al., 2007) in addition to its application as a learning platform (Jones, Blackey, Fitzgibbon, & Chew, 2010).

While it may seem that social media offers an obvious way to approach online learning because so many users have gravitated to it outside formal environments to share all sorts of information (Shirky, 2008), researchers have identified a gap between students’ perception of using social networking sites as an educational platform and the successful use of other educational technologies (Jones et al., 2010). Some of the contributing factors include a strongly perceived separation between social and educational life, issues of privacy and copyright, a sense of being flooded with too much information, and the feeling that instructors do not know how to technically integrate social media very well (Jones et al., 2010).

While this argues well for the need of more research into ways in which this genre of tools could be integrated into the educational lives of students, it may also suggest that

the forces that draw users to social networking sites are not replicable in, or organic to, the current set-up in higher education. Shirky (2008) proposes several reasons for why certain social tools are successful and others fail, which generally revolve around the needs of people to communicate and, once in a group, the needs of the group. “By understanding the two basic constraints of group action—number of people involved and duration of interaction—any given tool, new or familiar, can be analyzed for goodness of fit” (p. 268), and within in this context, the needs of adult learners and the technology that can support their learning are ripe for exploration. Social network sites are just one tool out of many that fall under the Web 2.0 paradigm, and they potentially have a great deal to offer instructors in distance and blended higher education learning environments. Web 2.0 tools such as blogs, wikis, podcasts (Beldarrain, 2006), social bookmarking (Alexander, 2006), photo and video sharing sites such as Flickr, Slideshare, and YouTube (Conole & Culver, 2009), Google Docs (Ohler, 2009), and many others all have social traits and uses that engender them to the development of rich online learning environments. Most all of these tools are ones that have found their way into general popular use and have potential for education.

New Paradigms for Learning

There has been broad agreement in the educational technology field for many years that the type of education our students need to be successful in the 21st century is not the same type of education that was developed and implemented during the Industrial Era (Lebow, 1993; Savery & Duffy, 1995; Schulman, 1992). The skills that many researchers say are needed for success in a post-industrial, information-based society must include skills that allow students to become lifelong learners that know how to problem solve (Schank, 1996), pursue understanding, knowledge construction, and epistemic agency (Scardamalia & Bereiter, 1991), are literate in ways meaningful in a world of rich

technological media (Kinzer & Leander, 2003), and have the metacognitive skills to make this learning possible (Lin, Schwartz, & Hatano, 2005).

Instructional design throughout the end of the 20th century explored a paradigm of dialog between the design and the learners using it (Reigeluth, 1999). This shift produced theories of design that brought together aspects of cognitive psychology, experiential learning, and the features of advanced technology. A recurrent theme in the work is the constructivist philosophical view that understanding is constructed individually by the learner in the context of the environment that it is learned in (Savery & Duffy, 1995). What is learned is a function of content, context, activity of the learner, and goals of the learner (Savery & Duffy, 1995). In addition, knowledge was something evolved through social negotiation and the evaluation of individual understanding (Savery & Duffy, 1995). This was a shift from the work that had been previously guiding instructional design, which had embodied more in the behaviorist underpinnings of Programmed Instruction and objectivist learning that assumed knowledge was a transferable entity from teacher to student, via instructional materials, one of which was a computer (Jonassen, 1996).

Toward the end of the 20th century, armed with online learning environments, online learning programs began appearing in secondary and higher education. Web-based tools like WebCT helped make it easier to organize online courses, incorporating class rosters, discussion forums, and the posting of mainly hyper-text based resources. However, at the time, most households lacked broadband access to the Internet, which limited earlier online learning (Bates, 2005).

As the 21st century progresses, broadband penetration is increasing in the U.S. (NTIA, 2010), and newer types of collaborative online tools, generally categorized under the label Web 2.0, have infiltrated the lives of today's students (Jones, Ramanau, Cross, & Healing, 2010). If used correctly, such tools could possibly provide new avenues to online collaboration and working together. The user base already exists for users of social

media; they are online and collaborating in informal settings (Brown & Adler, 2008), and while there are some pioneers in the education field utilizing these tools, there seems not be a consensus on how to best leverage such tools. Thus, higher education faculty, whether being asked to teach online or seeking to do so, have an opportunity to harness these powerful new tools that students have gravitated to outside of formal education settings (N. Jones et al., 2010).

Massive Open Online Courses (MOOC)

The early 21st century saw a trend in education that was at first spurred on by the dot com bubble, which was the attempts of several large universities to rapidly build a business model for online courses and also develop free open courses designed to increase mind-share. Often funded by grants and subject to the whims of the economy, these efforts, like Fathom from Columbia University, withered quickly when either supply outstripped demand or, like MIT's open courseware (OCW), has continued on, providing course content without much in the way of pedagogy (Walsh, 2011).

Several years on, there is a convergence of open course videos like OCW and the rapid rise of the Massive Online Open Courses (MOOC). Under the aegis of private companies, often spun off from universities, for example, Coursera and Udacity are both major players and spinoffs from Stanford University, or efforts like the Khan Academy, online courses are being developed that reach tens of thousands of students at a time. The courses and platforms available are currently attracting sponsors and university affiliations to offer the next generation in online courses.

Based essentially on video, MOOCs may offer the chance for students to respond via threaded discussion, or write an essay; however, the scale and lack of true interaction seemingly impact the effectiveness of these courses. In an interview in the *Chronicle of Education*, Ann Kirschner (2012), a former leader of CU's online effort Fathom, notes that the efforts were in essence "proto-MOOCs" and that she is "surprised the Coursera

format has evolved little beyond our pioneering efforts a decade ago” (p. B22). Her essay touches on the typical criticism of the MOOC, including high attrition, lack of true interaction, and a rather crude approximation of an in-person learning experience.

Kirschner’s are not an unusual set of charges. Fini, in a 2009 study, showed that MOOC’s structure and interaction can often leave students confused and desiring more filtered information from the professor. However, there is also a positive angle, as Kirchner (2012) writes, “Somewhere between the videos and readings and the occasional dip into the discussion groups, I found myself actually learning” (p. B22). The typical set up of a MOOC is video of lectures or webcam video of the instructor, which are broken up and sequenced into short clips in the delivery platform. The systems may also use machine grading of quizzes and tests to help assess student progress, or online discussions and even crowd-sourced grading (Parry, 2012).

The sudden attention that MOOCs attracted was indeed a boon to online education, but also one that highlighted that, while demand is there, proper implementation of pedagogies is still a moving target. Also, it is interesting to see that the platforms are being developed outside the universities, which means that they often fall outside the typical institutional oversights and systems. Issues that have begun to rise are often tackled in piecemeal ways, for example, how credit is given to or accepted from online course takers, as well as how institutions afford the use of MOOCs when their resources are being used to provide instruction but there are no fees or tuition being charged to students.

The 21st Century Learner

The terms “Digital Native” and “Digital Immigrant” were coined by Marc Prensky in 2001 and soon became buzzwords in the education technology literature. In the educational technology lexicon, the “native” is any student today who was born into a time where they always had access to the Internet, cell phones we’re never “neat,” and

multitasking is second nature. The “immigrants” happen to be the teachers, administrators, or parents. Another term synonymous with “native” is “Millennials,” meaning anyone “born on or after the year 1982” (Oblinger, 2003, p. 2).

The idea behind these terms, that technology could transform a generation of learners, was already being considered over a quarter century ago. Pea (1985), writing on the effects that computer software could have on reorganizing learning, wrote, “The software has also restructured the thinking activities involved in such a major way that computer users come to discover new methods of thinking about their mental tasks and unanticipated ways of using the technologies” (p. 175).

Jerome Bruner (in Pea, 1985) observed that culture with technologies such as the written language could “push cognitive growth better, earlier and longer than others” (p. 168). This idea was later expanded by Stephen Jay Gould (in Pea, 1985), who said that cultural evolution, in contrast to Darwinian biological evolution, was defined by transmission of skills, knowledge, and behavior through learning across generations, which has been our nature-transcendent innovation as a species. Pea used the spreadsheet as an example of a cognitive tool that has changed our culture, indicating that it made higher-level thinking about, and modeling of, budgets possible. People could easily do “what-if” exercises, and it decentralized the nature of accounting in businesses. Jonassen (1996) used the term “mindtools” to describe

computer software applications like databases, spreadsheets, semantic networking programs, expert systems, systems modeling tools, microworlds, hypermedia authoring tools, and computer conferencing, that enable learners to represent what they have learned and know using different representational formalisms. (p. 3)

Such technology has impacted our current generation students, according to theory, making them different types of learners than students of any other past era (Prensky, 2001).

Students today are entering higher education as “experienced multitaskers, accustomed to using text messaging, telephones, and email while searching the Internet and watching television” (Thompson, 2007, p. 2). These students, the Net Generation, are ready for multimedia learning to be delivered on a flexible learning schedule, one that is not tied to a set time and place.

Philip (2007) corroborates this argument, stating,

Net Generation students, having grown up in the presence of interactive media that have changed both their thought patterns and their expectations, already have some of these skills. They are accustomed to distributed cognition and virtualization, which demand a new way of approaching work and learning and open new possibilities for innovative work. (p. 5)

It is these students, who are in school now, that some researchers are saying will, in a grassroots way, change how education occurs (Duderstadt, 2004).

On the other hand, critics of the Net Generation or Digital Native labels say that perhaps the changes in student behavior should not be catered to that quickly. While these students can find information rapidly and use the electronic tools fluidly, they typically lack information literacy skills, and their critical thinking skills are often weak (Oblinger & Oblinger, 2005). For educators, providing technical tools may help engage the students, but it may not be as effective or as critical as improving the aforementioned skills (Barnes, Marateo, & Ferris, 2007). However, this also may be a changing set of values that need to be taught, rather than a reason not to harness the other affordances of technology.

In spite of the varying viewpoints on the attributes ascribed to Digital Natives (Bennett, Maton, & Kervin, 2008; Vaidhyanathan, 2008), Alexander (2008) sums up well the impact that such social and Web 2.0 media could have on students generally:

Not yet in middle school, future college students are already participating in online social networks, consuming digital media there, and starting to create digital content. Web 2.0 is not remarkable; it describes simply the background structure of media and socialization. (p. 197)

Prensky (2009) has moved away from defining learners and teachers as digital natives and immigrants and is using the phrase “Digital Sapiens” to describe less how generations differ in terms of technology usage and more on how

wisdom seekers in the future will benefit from unprecedented, instant access to ongoing worldwide discussions, all of recorded history, everything ever written, massive libraries of case studies and collected data, and highly realistic simulated experiences equivalent to years or even centuries of actual experience. (p. 1)

It has been noted that the web took only 4 years to become as widespread in use as the television did in 20 years (Brown, 2000). Broadband penetration has the potential to promulgate ideas and usher in the possibility of educational change through Internet technology. The potential effect of this is captured well by Bonk (2009), who identifies three macro trends (the three p’s) that are converging to transform education. They are:

- The availability of tools and infrastructure for learning (the pipes)
- The availability of free and open educational content and resources (the pages)
- A movement toward a culture of open access to information international collaboration, and global sharing (a participatory learning culture) (p. 52)

Considering the combinations possible between pipes, pages, and participation, it seems that there is an opportunity available for adopting technologies with the potential to take advantage of the proclivities of “digital native” learners and embrace collaborative approaches in online learning environments. As online courses become ever more prevalent in Higher Education (Allen & Seaman, 2007) and with Millennial students already embracing Web 2.0 tools, some researchers note that Higher Education institutions can offer the best type of learning environment for technology, one where “reflective, problem-based and inquiry-based learning is emphasized” (N. Jones et al., 2010, p. 780).

Higher Education and 21st Century Skills

Alexander (2008) asked what we are doing in higher education to adapt as Digital Natives enter adulthood and higher education. Not only is there a generational change in the students starting college, but also a shift is occurring in how students are attending college (Chronicle Research Services, 2009). A growing population of students is taking online courses, and most colleges and universities are either offering courses or full degrees online to meet this need. Chances are good that students, at some level of their higher education, will be taking courses that either are entirely or partially online.

According to a recent study (Picciano & Seaman 2009), it is estimated that over a million K-12 students took an online course in academic year 2007-2008. In higher education, it is estimated that in the United States, at the same time over 3.9 million higher education students were taking a course online (Allen & Seaman, 2008). Considering this demographic shift, it is important to also consider the impact of online learning on the structure of higher education generally in the 21st century. A 2009 report from Chronicle Research Services (2009) makes a case that the traditional four-year college experience is no longer the norm, “as demonstrated by the proliferation of colleges (particularly for-profit institutions), hybrid class schedules with night and weekend meetings, and, most significantly, online learning” (p. 1).

It is not only in higher education that technology is having a transforming effect. Grant (2006) writes, “Changes in the developed world are leading to a move away from economies based solely on ‘traditional’ industries toward a new ‘knowledge economy’” (p. 1). Businesses and governments are embracing the changes wrought by Web 2.0 (O’Reilly, 2005; Tredinnick, 2006). If one of the goals of higher education is to help students become competent, collaborative, problem-solving employees of tomorrow (Scardamalia, 2002), then it would seem a logical extension that colleges should be preparing students to be critical producers and consumers of information (Buckingham, 2003; Buraphadeja & Dawson, 2008; Marks, 2009). The development of critical thinking

and communication skills is an important component of higher education (Burbach, Matkin, & Fritz, 2004), and collaboration with others is a key element to truly support thinking critically (Choy & Cheah, 2009).

As Brookfield (1995a) states, the key to exploring ideas and values is to open them up for discussion and the viewpoints of others. Within the Web 2.0 paradigm, discussion and social contributions is an underlying theme, and within the Web 2.0 toolset, there is an increasingly viable set of tools available to instructors for use in their instruction, both online and in person. Instructors in higher education can begin embracing the tools that students and businesses are already using to teach 21st century skills like communication, critical thinking, and collaboration. In order to do this, not only should new collaborative Web 2.0 be integrated into teaching, but techniques that support their use need to be understood and used to structure their use in class. In addition, not only is it important for higher education courses to meet the digital native student's needs, it also should help the digital immigrant to feel more comfortable in the online collaborative environment.

Learning Technologies

Anderson (2008) points out that technology should be regarded as a vehicle for the instructional methods employed by the educator. Different technologies will have differing affordances and constraints, but at the heart of it,

the goal of any instructional system is to promote learning. Therefore, before any learning materials are developed, educators must tacitly or explicitly know the principles of learning and how students learn. This is especially true for online learning, where instructors and learners are separated. The development of effective online learning materials should be based on proven and sound learning theories. (p. 18)

To take advantage of the power of online learning, educators must reflect on their own practices and see if their approach meshes well with the characteristics and preferences of their students. Different philosophies toward learning will suggest

different tools, and different tools can be used to reach students in different ways (Kanuka, 2008). While the unique learning styles of students should be taken into consideration (Ally, 2008), one constant is that college students today are not expecting traditional pre-digested, sequenced learning (Tapscott, 1997). With the vast array of tools available and, for most educators, a paucity of experience with online teaching and learning, some “online learning theory needs to help educators decide which of the numerous technological options is best suited for their application” (Anderson, 2008, p. 54).

The importance of selecting the correct tools to situate the learning activities is also expressed by Oubenaissa, Giardina, and Bhattacharya (2002), who write, “The dynamics allowed by the environment became the main element that orients the design approach” (p. 42). This view shifts a great deal of power to the instructional designer and choices that are made when considering the dynamics of the group being taught, the content being learned, and the interactions desired by both the instructor and the learners. The authors elaborate on the role that tool choices play on the rich interactions within online learning environments when they write, “With learning spaces becoming more complex and dynamic by the potential of sophisticated and intelligent technologies, these spaces are now defined by their tools, type of activity and interactivity, and work sharing allowed to learners” (p. 43).

Taking into consideration the growth in the numbers of students taking online courses, it becomes important to look at the pedagogical choices instructors may make, coupled with the types of technology that can best support these approaches, to help us take maximum advantage of both recent technologies and best practices in adult and collaborative learning.

A place to begin is by looking at the “explosion of web blogs (Richardson, 2006) and user-friendly course content management systems built into web delivery systems, such as Blackboard® and Moodle, which are creating environments in which teachers

and learners can easily create and update their course content without the aid of programmers or designers” (Anderson, 2008, p. 54). The ease of use does allow educators to manage their own content; however, there are potential pitfalls if tools are chosen that do not match with the learning needs, or fall short of the desired outcomes, which can often result in the development of cumbersome workarounds. Anderson reminds us that, while educators may be excited about the ability to give students access to information, online education is not just about access but the ability to communicate and interact.

Downes (2005) warned that current Learning Management Systems often end up mimicking traditional educational structures and instructional design. He argues that the Digital Natives bring with them a different set of expectations, and recent phenomena such as file sharing and social networking sites point to students who believe that information is shared and participated in. He defines “E-Learning 2.0” as a harnessing of the attitude and the properties of “communication networks” to help educators move away from traditional teacher-directed approaches and argues for student- or learner-centered design by using social and Web 2.0 technologies. “In general, where we are now in the online world is where we were before the beginning of e-learning” (p. 1). However, conditions are favorable for a shift in teaching paradigms:

Learning is characterized not only by greater autonomy for the learner, but also a greater emphasis on active learning, with creation, communication and participation playing key roles, and on changing roles for the teacher, indeed, even a collapse of the distinction between teacher and student altogether. (p. 1)

Web 2.0 tools do not supplant the LMS tools mentioned above; rather, they are part of an arsenal of tools that can be employed within grouping techniques and structured learning environments and should be viewed in terms of their affordances and constraints. Criticism of LMSs seem to revolve around their rigidity and lack of social networking; for example, McLoughlin and Lee (2007) write, “The current generation of

LMS's allows each student to have their personal view of the course(s) they are enrolled in, but many do not accommodate the social connectivity tools and personal profile spaces that students might choose" (p. 5). Though it is important to note that some newer platforms like Moodle have been engineered around social learning ideas (Bonk, 2009), they are also tools that, for the most part, are used to present courses in typical semester long formats and approach social media as a "walled garden" (McLoughlin & Lee, 2007). Acknowledging similar constraints, Davis, Little, and Stewart (2008) remind us of some of the affordances that LMSs offer, including, being interfaced with the library, student information system, and other digital resources, with log-in via a secure server to access course content. Although it is often necessary to go beyond the LMS because of the constraints in its social learning tools, the structure that the LMS offers can still be useful in the development of the online environment.

Recent literature lends weight to the assertion that there has been a change in the concept and value of knowledge due to the availability of networked information (Bonk 2009; Felix, 2005; Gray, Ryan, & Coulon, 2004; McCombs & Vakili, 2005; Siemens, 2004). For adults, this is reflected in some learning theories such as Heutogy (Hase & Kenyon, 2000), in which the researchers indicate that with the arrival of the Internet, knowledge is readily available and online learning should reflect the harvesting or connection of the information that is readily available. This view suggests that new approaches are indeed needed in teaching and learning. For example, Siemens (2004) defined a new approach to learning coined Connectivism, which he contrasts with Constructivism:

Unlike constructivism, which states that learners attempt to foster understanding by meaning-making tasks, chaos states that the meaning exists—the learner's challenge is to recognize the patterns, which appear to be hidden. Meaning making and forming connections between specialized communities are important activities. (p. 4)

The keywords “flexible, inclusive, collaborative, authentic, relevant, global and effective” (Felix, 2005, p. 86) are terms that should guide the design of online learning courses, and all draw upon the constructivist and social constructivist approaches. Gray et al. (2004) wrote:

In recent years, it has been recognized that eLearning is not merely another medium for the transmission of knowledge but that it changes the relationship between the teacher or trainer and learner. It requires new skills, competencies and attitudes amongst those planners, managers, teachers and trainers who are going to design and develop materials and support learners online. In short, the development of innovative practices and the generation of new competencies in eLearning are fast becoming key issues for teacher and trainer training. (p. 2)

A metaphor used by Gilly Salmon (2005) equates online learning with man’s approach to flight. First, she wrote, man tried to emulate birds, with little success, then, after a re-conceptualization of the methods and technology, invented the airplane and was able to fly; the same, she writes, is occurring in online learning. Phase one was recreating current classroom practices online, and in the second phase, “learning technologies are used in new ways, to advance beyond what was possible in the classroom or to combine traditional approaches with e-learning in effective and worthwhile modes to meet new objectives and purposes of teaching and learning” (p. 202).

Again, social learning theories come into play. Downes (2005) draws a parallel between social networking and education using the example of Communities of Practice (Lave & Wenger, 1991). This theory is one in which members of community share a domain of interest and develop shared resources while learning (Wenger, 1998). Interactions of such can exist online, especially if the attitudes and technologies of Web 2.0 are employed. However, as Downes (2005) notes, they rarely happen in online learning to date; the closest thing to communities of practice, he sees, rarely extend past use of online discussion tools. Essentially, instructors in higher education tend to use

Learning Management Systems that have been noted to lean toward replicating current teaching practices in an online environment (Downes, 2005; Salmon, 2005).

McLoughlin and Lee (2007) discuss the need to move beyond the LMS structure, which they also say replicates the power structure of the lecture-centered institute of higher education and ease this tension in eLearning that wants to be collaborative and customizable. They re-conceptualize the role of the LMS as “a learning environment as an approach, not as an application” (p. 5). They warn that, once outside the structure of the LMS, tools should be chosen based on their affordances and undergirded by learning theory.

Considering the affordances of Web 2.0, technologies need to think how to move beyond current limitations and re-think how online learning is delivered so it can achieve flight. Tools that harness the ideas of Communities of Practice and engage social learning practices are key to this next step.

Conole and Culver (2009) argued that there is an implicit desire to contribute in a Web 2.0 environment. They suggested that, in a Web 2.0 environment, “users add content because they want to share their photos, videos or presentations with others and the net result is of aggregate benefit to the community” (p. 763). The researchers posit that a lack of participation in current online learning efforts has hampered development of tools and techniques and that “effective application of Web 2.0 principles can provide a means of addressing the lack of uptake and sharing of learning and teaching ideas and designs” (p. 764).

Alexander (2008) pointed out that many educators already use tools like blogs, podcasts, wikis, and other available Web 2.0 tools. For many educators and their institutions, this can be an important benefit. Tools like the blogging platform “Wordpress,” iTunesU for distributing podcasts, to online productivity suites like Google Docs are readily available to educators to take advantage of, and campuses rarely have to pay for their use.

There are downsides; the literature mentions issues of privacy (Ellison et al., 2007), longevity of the tool's existence (Davis, 2009), and availability of institutional support, as many of these technologies have low technical barriers to adopt (Bates, 2005).

Pedagogically, an issue that affects the effective use of the strengths of Web 2.0 is that there are “few ‘definitive’ answers to what instructional principals or processes should be adopted for eLearning design” (Gray et al., 2004). This is a broad statement, and there are many facets to consider, one being that faculty who are tasked with teaching online may not be familiar with the tools and techniques that encourage student participation and social knowledge building (Carr-Chellman & Duchastel, 2000; Gray et al., 2004).

Additionally, issues such as faculty professional development and training need to be addressed along with attitudes of accepting online teaching as something comparable to face-to-face teaching (Allen & Seaman, 2007). With ever more new and different tools being created and released, another issue that arises is how faculty keep up both with technology and choosing the right to match teaching techniques and learning goals, not just choosing it because it is new and interesting (Bates, 2005).

The concept of Pedagogy 2.0 (McLoughlin & Lee, 2007) supports the idea of faculty preconceiving how they create their curriculum and approach their teaching. Curriculum should consider “the interdependence between ideas, individuals, communities, and information networks, supported by technology” (p. 5). While this may seem like a straightforward goal, the construction of such curriculum is apt to be festooned with foibles and folly. Choosing tools needs to be “underpinned by an explicit learning paradigm and informed by pedagogies that support learner self-direction and knowledge creation” (p. 4).

Faculty Preparedness for Online Education

While it would seem that technically many pieces are in place for a sea change in online education, from an instructivist to constructivist approach it is necessary to consider the demands this places on faculty and the expansion of the roles that they must fulfill when becoming online teachers (Bennett & Lockyer, 2004; Felix, 2005).

Lewis (2006) expressed that, in a perfect world, instructors who have been asked to teach online would have adequate training and institutional support. However, he notes that this was not his experience as he took a self-directed approach to running a course. Ham and Davey (2005) expressed this dilemma, too, when writing about how they were required to teach some of their course load online with no formal training:

In the last few years both of us have had to come to grips with an institutional requirement to conduct all or part of our courses “online,” and in doing so we have been interested to reflect on the andragogical challenges that such modes of delivery present. (p. 257)

The authors posed a set of questions that reaffirm that their commitment to teaching, and that higher education, is connected with the aims of adult education in that it is not so much a “technical” or “instructional” training but “interpersonal and developmental” (Ham & Davey, 2005). They ask, “Is it possible to generate a productive sense of a community of learning online which matches the sense of developmental community built up through repeated face-to-face contact in tutor groups? What, in short, constitutes for us the effective andragogy of online teaching?” (p. 258). Some of their key findings were that teaching online takes much longer to set up than traditional courses, keeping students motivated is more difficult, and that “interactive is not the same as interpersonal,” which they indicate both their students and their selves value the most (p. 263). They conclude with mixed feelings that “we need to be more confident that the online delivery of higher education is desirable, not just possible. In short, we need a sounder *pedagogy/andragogy* of online education, not just a technology” (p. 263).

Felix (2005), though not specifically addressing higher education faculty, summed up succinctly some of the basic issues affecting faculty moving into online teaching:

What is obviously required for teachers if they are to facilitate successful constructivist learning is the ability to change the culture, climate and dynamics of the classroom or the online environment. For this to happen they need to have fully understood and internalized the conceptual philosophy of the approach and the processes that will produce the best outcomes. Often, though, teachers do not have the time to study in great detail a method they may feel they have understood superficially, and even more importantly they can be hampered by their own learning experiences, largely informed by instructivist epistemology. (p. 89)

Some guidance to the roles and expectations of the online faculty can be found in the teaching competencies frameworks of Tigelaar, Dolmans, Wolfhagen, and Van Der Vleuten (2004) and Goodyear, Salmon, Spector, Steeples, and Tickner (2001). These frameworks focus on the providing a heuristic of roles that faculty play as they teach online (Goodyear et al., 2001) and the skills that are most valued as instructors in higher education (Tigelaar et al., 2004). As higher education becomes more student-centered, there are different demands on teacher competencies (Tigelaar et al., 2004). Updating several earlier frameworks, Tigelaar et al. propose competence in the following domains to be most important to successful teaching in higher education:

- Person as a teacher: is skilled at communication, has a positive attitude towards students, exhibits respect for all students.
- Expert on content knowledge: is capable of using relevant information from specialist literature for his or her own teaching, has thorough knowledge of his or her subject, has knowledge of developments in his or her subject.
- Facilitator of learning process: Developer, Counselor, Evaluator, Organizer and Scholar/lifelong learner. (pp. 262-263)

Tigelaar et al. state that “a framework of teaching competencies adjusted to current, more student-centered education environments can be useful as a starting point for evaluation purposes and for teachers to set professional learning goals” (p. 255).

While Tigelaar et al.’s framework is purposefully broadly defined in regard to skills, Goodyear et al. (2001) ask the questions, “How should such online teachers be

recruited and trained? How can we define competent online teaching performance? What kind of profile of competences should be used in recruitment?" (p. 66). The authors, too, subdivide the roles of an online teacher. They propose the roles of content facilitator, technologist, designer, manager/administrator, process facilitator, adviser/counselor, assessor, and researcher (p. 69). This framework goes deep into describing specific skills and instructions the online teacher should have and follow. In light of the frameworks, it would seem that a great deal of importance is placed not only on sound pedagogical understanding but also on facility with the current crop of online tools.

Allen and Seaman (2007), in a survey of public and private higher education institutions that provide some level of online education, report that faculty acceptance of online education as being as good as, or better than, face-to-face learning is low. To truly create an online educational environment, it needs to be accepted that

E-learning, whether combined with other forms of teaching and learning or not, is multifaceted and involves shifts both in understanding and behaviours. Most academics responsible for both the curriculum and the pedagogical processes arising from e-learning have not made these shifts. (Salmon, 2005, p. 205)

These shifts have ramifications both at the institutional and faculty level.

For faculty who are teaching online, many questions over instructional design may exist; however, Web 2.0-style learning has a rich set of constructivist and social constructivist educational theories and practices to draw on (Felix, 2005; Gray et al., 2004). Additionally, problem- and project-based learning, discussion, and formal and informal grouping techniques (Davis, 2009) are among the many techniques available to instructors in online teaching. Too, collaborative tools have lowered the bar for accessing technology, but the use of technology needs to be coupled with teaching strategies and andragogically sound purposes for students to reap their instructional benefits. Online learning tools, without proper facilitation, projects, groupings, and carefully considered activities, cannot not educate on their own (Salmon, 2005).

Citing a 1994 study by Saba and Shearer, Felix (2005) explains how they demonstrated that effective distance education is supported by minimizing the perceived distance between the learners and the amount of control an instructor maintains. The more structure an instructor imposes, the more distance is perceived, while with more student dialog, distance is lessened.

If distance is truly a function of the responsiveness of an educational program to its students, then the quality and amount of transaction between the learner and the instructor, regardless of their geographic proximity, becomes of utmost importance. The desired instructional strategy becomes maintaining a proper balance between dialogue and structure. (Saba & Shearer, 1994, pp. 54-55)

Since the technical underpinnings of social networking and other Web 2.0 tools are to increase dialog and the influx of user created data, it would make sense that their use, while being presented to users in a structured manner, also then turns over control to them. If the desired instructional strategy is a seamless shifting of the locus of control between learners and the instructor (Philip, 2007), then understanding the needs of the learner is an important step before choosing the tools and strategies to develop the online environment (Anderson, 2008). One way to look at the needs of learners is by delving into the literature and theories surrounding adult learners.

The Adult Learner

Much of the literature on adult learning points back to the work of Malcolm Knowles (1973), who in the early 1970s developed the learning theory Andragogy. Comprised of five assumptions, andragogy describes the needs of adult learners:

1. *Changes in self-concept*: The point where an individual achieves self-concept is when they become psychologically an adult. “Students who have entered a professional school or a job have made a big step toward seeing themselves as essentially self-directing” (p. 45).

2. *The role of experience*: As an individual matures, “they accumulate an expanding reservoir of experiences that causes him to become an increasingly rich resource for learning” (p. 45).
3. *Readiness to learn*: As an individual matures, the readiness to learn is less one of biological development and more of “developmental tasks required for the performance of his evolving social roles” (p. 46).
4. *Orientation to learning*: Children have been conditioned to subject-centered learning, but adults may have a more problem-centered orientation. Knowles states that children learn things with “postponed application,” with very little of what is learned truly applicable to pre-adolescent life. An adult comes to learning because he needs to learn something, or, as Knowles writes, “because he is experiencing some inadequacy in coping with current life problems” (p. 48). This orientation also implies a desire to apply learning rather immediately to life situations.
5. *Motivation to learn*: Knowles (1984) suggests that while there are some external motivators, such as a raise in salary or a better job, there is an assumption that as a person matures, the motivation to learn becomes internal (Smith, 2002).

There is a wide range in ages of learners as to when they can be considered to have the characteristics of adult learners (Connolly, 2008). Traditional first-year college students already have several of the key components that adult education is based on, including prior experiences and the ability to critically reflect on these experiences. However, it is also noted, “Higher Education is also a changed environment. Mature students are increasingly prominent in third level populations, and the necessarily challenge the traditional hierarchical relationships between students and lecturers” (p. 14).

For Knowles, pedagogy and andragogy are not exclusive of each other. He indicated that there are many instances where the principles of intrinsic motivation, readiness to learn at need-to-know moments and self-directedness, are exhibited by children learners, and there are other times when adults need more guidance (Knowles, 1984). However, the curriculum designed under andragogy differs from curriculum designed under the pedagogical perspective. For example, a teacher using pedagogy will determine what content will be covered and how long it will take to cover the content as it is broken down into smaller units, determining the logical order and presentation of material. Under the andragogical model, the teacher (considered a “facilitator”) assumes the “role of designer and manager of processes or procedures; and only secondarily, the role of content resource” (p. 14). Knowles explains that an important role for the facilitator is to create a climate for learning, one that engenders psychological factors such as mutual respect, willingness to collaborate, mutual trust, supportiveness, openness, authenticity, pleasure, and humaneness. In addition, he encourages involving the learners in the planning of the learning.

The assumptions of the andragogical model have been widely incorporated into and expanded upon in other learning theories. For example, the concept of self-directed learning is an important and recurring theme in adult educational theory and is central to many of arguments and models offered.

Brookfield (1995b) describes self-directed learning as a theory that “focuses on the process by which adults take control of their own learning, in particular how they set their own learning goals, locate appropriate resources, decide on which learning methods to use and evaluate their progress” (p.1). Merriam (2001) expands on this definition, writing, “learning that is widespread, that occurs as part of adults’ everyday life, and that is systematic yet does not depend on an instructor or a classroom” (p. 8). She credits Allan Tough’s work in the late 1960s and early 1970s for providing the major thrust for research in this aspect of adult education.

Self-directed learning has at its core three goals (Merriam, 2001), the first of which is to teach adults to be self-directed learners. Ross-Gordon (2003) indicated that the amount of self-directedness of a student in adult education can be seen on a continuum and facilitators should be able to make adjustments to the amount of support and expectations they have for the learners. In fact, Merriam (2001) described how Knowles himself changed from thinking that adult learners were self-directed to thinking that it was more of a situationally determined principle, and that when topics that an adult knew nothing about were being introduced, the adult learner was more dependent on the teacher for direction. The second and third principles of self-directed learning tie closely to fostering of transformational learning and promotion of emancipatory learning and social action.

While the above principles of andragogy and self-directed learning provide a broad outline of some of the items to consider when creating a learning environment for adults, Brookfield (1995b) urged caution in accepting them at face value when he wrote, “Despite the plethora of journals, books and research conferences devoted to adult learning across the world, we are very far from a universal understanding of adult learning” (p. 1). He warned of myths that border on orthodoxy in the minds of adult educators, such as adult learning is inherently joyful, adults are innately self-learners, and that good educational practice is that which meets the needs articulated by the learners. Rather, he argued that other variables, such as culture, ethnicity, and political ethos, are as important as chronological age. Brookfield’s work on critical reflection was informed by the work of Jack Mezirow and transformational learning theory.

A growing body of literature on transformational learning provides another guide to fostering learning in adults. Instead of viewing knowledge as something “outside” the person or learning as “instrumental,” learning is seen as an “enhancement of present knowledge, skills or abilities” (Dirkx, 1998, p. 1). As Mezirow (1997) explains:

Adults have acquired a coherent body of experience—associations, concepts, values, feelings, conditioned responses—frames of reference that define their life world. Frames of reference are the structures of assumptions through which we understand our experiences. They selectively shape and delimit expectations, perceptions, cognition, and feelings. (p. 1)

It is a premise of adult education that learners can use their body of experience as a source on which to reflect and challenge previous assumptions and habits. It is the goal of adult education to use these frames of reference as a way to engender transformation. Thus, learning is when there is change in the perspectives and assumptions of the learner (Mezirow, 1997). During this process of transformation, the learner will become aware of their biases, their prejudices, and gradually able to change their way of thinking. Mezirow writes, “We do not make transformative changes in the way we learn as long as what we learn fits comfortably in our existing frames of reference” (p. 2). Another goal of transformational learning is to create a learner who continues to learn, which is a key element, he argues, in the workplace of the 21st century. In addition, the learner must also be collaborative while able to think autonomously (p. 3).

Brookfield takes the role of critical reflection on one’s experiences and adds several methods of getting feedback and other perspectives, which he feels are key elements in effectively reflecting critically. In *Becoming a Critically Reflective Teacher*, Brookfield (1995a) discusses how to approach critical reflection through the autobiography (one’s own experiences), encouraging feedback from colleagues, getting the student’s perspective, and consulting professional literature. These lenses, he argues, all work together to help the practitioner become aware of underlying assumptions and practices. Brookfield writes, “Becoming aware of the implicit assumptions that frame how we think and act is one of the most challenging intellectual puzzles we face in our lives. It is also something we instinctively resist, for fear of what we might discover” (p. 2).

Brookfield (1995a) introduces viewing one’s assumptions from other points of view because “to some extent, we are all prisoners of trapped within the perceptual

frameworks that determine how we view our experiences” (p. 28). It is difficult to objectively view our own practices and reflect on them while we filter them through our own interpretations. The teacher/student dynamic is one that is fraught with imbalances of power, cultural differences and laced with the assumptions (Brookfield, 1995a, 2002). While Brookfield (2002) uses this framework to assist teachers in transforming their craft, he acknowledges its extrapolative nature to other applications in adult education: “Critical reflection also forces us to confront deeper assumptions concerning the submerged and unacknowledged power dynamics that infuse all practice settings” (p. 32). The role that critical reflection plays in adult education is an important consideration going forward and will return in the guise of multiple perspectives supplied through collaborative online practices.

Some researchers noted a schism between the ideals of self-directed learning and how online learning was being implemented (Hase & Kenyon, 2000). In their research, they noted that in keeping with accepted definitions of self-directed learning, asynchronous online learning courses were available to the learner when they were ready to participate; however, unlike self-directed learning, the learning was as teacher-directed and pre-determined as traditional lecture-based courses. The authors contend that any examination of online learning materials will reveal the equivalent of a sequence of teacher-directed materials, rather than a student-developed course of study. They explain that for adult learners in the 21st century, course designers need take the tools and techniques offered by andragogy and move beyond the implicit teacher-student relationship that is still at the heart of the theory.

Taking additional cues from self-directed learning theories, Hase and Kenyon (2000) define heutagogy as a framework that “goes one step beyond andragogy, to a new set of principals and practices that may have application across the whole spectrum of the education and learning lifespan” (p. 2). Heutagogy reflects the changing nature of work and expectation of learners in the 21st century. Ashton and Newman (2006) explain,

“Students today need to be encouraged to be troubleshooters, problem solvers and general consultants, recognizing the capability of learners of all ages to build their own knowledge and understanding” (p. 829). Essentially, the core of heutagogy sees knowledge as abundant and “made available by ICT’s (Information and communication technologies) in a global world” (p. 829), and ultimately, true learning happens through knowledge sharing, not knowledge hoarding.

Since a main complaint of Hase and Kenyon (2000) revolves around the notion that distance learning is “flexible” and “self-directed” by the development and delivery of carefully crafted print-based materials, what they say is flexible in this case is the materials, not the learning. A heutagogical approach, they suggest, is where learners fully take control of the direction of the learning and may “read around critical issues or questions and determine what is of interest and relevance to them and then negotiate further reading and assessment tasks” (p. 5).

Heutagogical learning concepts fit naturally with social learning theories and can inform educators in developing new approaches to online learning. In a sense, the ideas of heutagogy, experiential learning, critical reflection, and transformative learning reflect something that Knowles (1984) wrote in an introduction to *Andragogy in Action*:

For many kinds of learning, adults are themselves the richest resources for one another; hence the greater emphasis in adult education on such techniques—group discussion, simulation exercises, laboratory experiences, field experiences, problem-solving projects, and the like—that make use of the experiences of the learners. (p. 10)

Creating an online environment and experience for the adult learner to engage in requires the leadership skills of an instructor and the self-directedness of the adult learner (Fahy, 2008). Before delving into the tools and techniques educators can use, it may be useful to explore social learning and what some of the necessary skills for learners in the 21st century are to master.

Instructional Design and Social Constructivist Learning

Research on social learning proliferated in the late 1980s through the turn of the century. The Cognition and Technology Group at Vanderbilt University (CTGV, 1992) developed the theory of Anchored Instruction; Schank (1996) developed Goal-Based Scenarios; Jonassen (1998) described problem-based learning in terms of Constructivist Learning Environments; and Spiro et al. (1991) developed the Cognitive Flexibility Theory for advanced knowledge acquisition. Most of the theories and environments, which covered a diverse spectrum of video-based environments to hypertext problem spaces, drew from a common well of social learning theory.

The constructivist learning environments that were developed took into considerations several seminal theories of behavioral, social, and cognitivist learning. Bandura (1977) connected cognitive and behavioral thinking when he wrote:

Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally and from modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action. (p. 22)

Vygotsky's (1978) Zone of Proximal Development helped frame the role of the computers and learners. The crux of the theory is that learners will learn from interacting with a slightly more experienced learner. Coupled with collaborative online tools, the Zone of Proximal Development is an important tool for the instructor in developing collaboration environments. In addition, Lave and Wenger's (1991) work in situated learning has been an important building block, where they propose that learning is something that occurs during the process of assimilating into a culture (in contrast to abstract learning in a classroom).

Such work, for example, provided a basis for the ideas of "cognitive apprenticeship" from Brown et al. (1989). Much like a traditional approach to

apprenticeship where a learner works with a master of the trade, the learner is working with a teacher who is modeling behaviors and actions that result in mastery of a skill. The teacher acts as a guide, providing authentic learning experiences and support or “scaffolding” that fades as the learner’s skill increases. Since learning is contextually bound, it is important that the tasks have real-world viability and a buy-in factor from the learner (Jonassen, 1998).

Traditional educational technology valued replicability, reliability, communication, and control; however, these values clash with the seven primary constructivist values of collaboration, personal autonomy, generativity, reflectivity, active engagement, personal relevance, and pluralism (Lebow, 1993). Some of the principles of Constructivist Learning are that the learning activities are anchored in a larger task or problem, learners define or adopt the problems they are solving, they usually work together to solve the problems, they are given scaffolding to support their learning, and they are encouraged to test their ideas against the views of others (Savery & Duffy, 1995).

It is within these social constructivist frameworks that we can find connections with the ideas of andragogy and adult learning. Adults, it is assumed, have some purpose to want to learn and will tend to guide themselves as they do. They will work with others collaboratively to construct meaning and develop communities of practice.

The online collaborative tools remove the framing of the physical learning environment, replacing it with virtual interactions. Selecting appropriate tools for an online environment can be a challenging task for faculty with a limited amount of training and exposure with new technologies.

Constructing the Environment

One of the jobs of the adult educator, according to Knowles (1973), is to set the atmosphere for learning. In creating a democratic and open environment, discussion can

be used to explore ideas critically and without fear. As Brookfield and Preskill (2005) note:

When participants take a critical stance, they are committed to questioning and exploring even the most widely accepted ideas and beliefs. Conversing critically implies an openness to rethinking cherished assumptions and to subjecting those assumptions to a continuous round of questioning, argument and counterargument. One of the defining characteristics of critical discussion is that participants are willing to enter the conversation with open minds. (p. 7)

A goal of the adult educator, regardless of the venue, is to create an environment that is safe, open, and inviting, but, at the same time, structured. Connolly (2008) writes,

The ultimate purpose of critical adult education has to be the creation of learning sites where questions and doubts are positive, active learning, not signs of failure, ignorance or weakness. A high level of trust has to be present if group members feel they can take the risk of exposing themselves through contributing. (p. 54)

A significant role of leadership in adult education is to cultivate an open and trusting environment that focuses on the learning. A facilitator anticipates group dynamics and recognizes members' talents to promote an environment not only of trust, but also of learning (Hurst & Thomas, 2008). A common complaint is that online it is not easy to get this sense of a class. In open social media, groups often coalesce around niche interests in low-stakes environments, and moderation may come about by leadership taken by particular group members or by ethical codes of conduct stated by site owners (Shirky, 2008). Discussion group moderation in adult learning environments typically requires a good deal of facilitation and input by the instructor, possible because the groups are less organic in their origins, the topics are often not so specific to niche interests, and the timeframe that group activity must occur in is much more structured and finite; several of the forces that shape groups' use of social media require a different degree of management.

Acknowledging the depth of research concerning Communities of Practice, Situated Cognition, and Cognitive Apprenticeships, Brown and Adler (2008) explain that

what educators need to do is build learning communities around the social learning activities prevalent in the 21st century, aided by collaborative online toolsets and informed by interacting communities. On their own, online resources do not have the important reflective qualities that learning requires, and online tools do not have value without participants (O'Reilly, 2005; Shirky, 2008). However, by utilizing the resources available in terms of open education resources, collaborative tools, and LMS systems, and borrowing liberally from social learning theories and adult group learning, formal courses of study can be brought to life for the online student.

Prodsusage

The affordances of online collaborative tools, by definition, extend the possibilities of collaboration for online adult learners. Bruns (2009) offers the term “prodsusage” in his exploration into how collaborative practices have begun transforming many of the information-based industries and media outlets that rose to prominence under a hierarchical industrial model. Citing the rise of Wikipedia as a “prodsused” information resource, Bruns carefully lays out how various societal and human needs shaped its construction. Furthermore, he takes a look at how a heterarchical and reputation-based editorial structure relies on the “equipotentiality” of all contributors, who have to earn and maintain their status in the prodsusage community.

The ideas behind prodsusage can be traced to an evolution from two converging forces, the rise of the “prosumer” and the Computer Supported Collaborative Work (CSCW). The “prosumer” in the middle of the 20th century may have had but a small voice within the industry that developed the products they used; however, today the “prosumer” is a guide on Amazon and other websites, wielding influence and authority over products. CSCW gained prominence in the workplace toward the latter part of the 20th century through the development of computer-based collaborative tools. With the widespread adoption of the World Wide Web and the subsequent development of Web

2.0 tools, this collaborative space, once confined to the workplace, has been extended into people's everyday lives. Thus, the term "Prodsusage" relates not merely to the act of users contributing their knowledge, expertise, and time to the creation of knowledge products, but also to an effortless traversing of a continuum that encompasses being a passive, albeit informed, consumer to an active information producer.

Bruns (2009) lays out five principles that define how Web 2.0 tools are open to collaboration and prodsusage. These principles have broad implications for the tools that are selected and activities developed that harness the collective efforts of online adult learners. They are:

- *Open participation, communal evaluation*: Content quality control and improvement are probabilistic, meaning that the more contributions, no matter the size, are reviewed and edited by others, the better the quality will become. "Prodsusage therefore draws on a broad range of available knowledge, skills, talents, and ideas as is available, and encourages its participants to apply these diverse capacities to the project at hand" (p. 24).
- *Fluid heterarchy, ad hoc meritocracy*: "the assumption that while the skills and abilities of all participants in the prodsusage project are not equal, they have an equal ability to make a worthy contribution to the project" (p.25). This approach "allows project leaders to emerge from the community based on the quality of their contribution" (p.25), rather than from traditional hierarchical models. The structure of a prodsusage community is always in flux, which allows for flexibility and individual decisions instead of whole-group thinking.
- *Unfinished artifacts, continuing process*: Since projects are based on equipotentiality and probabilistic outcomes, they are broken down granularly and accepting of the smallest contributions. As a result, they are always "unfinished, and infinitely continuing." Bruns explains how both community pressures along with technological tools help safeguard against serious

vandalism and keep progress continuing in a positive direction. The outcome of produced projects is not a final product, as it would be in an industrial model; rather it is “snapshot in time.”

- *Common property, individual rewards*: “Participation in produsage products is generally motivated mainly by the ability of producers to a shared communal purpose” (p. 28). While the product is communally held, users are given credit for their efforts and work to build their reputation. Usually there is no monetary award attached to their contributions, but often their reputation in the produsage community can be used for “professional accreditation or employment opportunities” (p. 29).

Produsage in education. Bruns (2009) discusses the role of academia in relation to produsage and calls for it to imagine teaching students how to be effective communicators and producers. He suggests that instructors become the lead producers in a classroom to help model and use the tools effectively. The four main concepts behind produsage are a part of academia’s DNA; thus, “what remains necessary is to translate such already existing and successful models, based on communal, collaborative knowledge development and peer evaluation, from the realm of academic research to the wider environment of education” (p. 355).

Bruns (2009) proposes what he calls the C5C model for education, which stands for the terms that define the produsage approach: creative, collaborative, critical, combinatory, and communicative (p. 341). He believes that when these five capacities are instilled in students, they have the skills and disposition to be effective producers, with the ability to work both independently and collaboratively toward shared goals and achieve desired learning outcomes. A brief description of the 5 C’s:

- *Creative*: Creativity is key, as the mixture and ability to collaborate require the students to be flexible and able to exercise creative capacities. For the instructor, this means that “to the extent that the reasons for this are not yet

already self-evident to contemporary learners, it may also be necessary to provide motivations for engaging as active content creators in prod usage environments” (p. 341).

- *Critical*: “health critical stance” to judging the quality of the content, origins of the information, history of changes. Also critical of when to collaborate.
- *Combinatory*: “Produ usage is fundamentally based on an approach which deconstructs overall tasks into a more granular set of distributed problems, and therefore in the first place generates a series of individual, incomplete artifacts which require further assembly before becoming usable and useful as a whole” (p. 343).
- *Communicative*: teaching people to be metacollaborative, thinking about the processes of collaboration and one’s own contributions. It may not be a natural process for students, which means it needs to be developed and modeled (p. 341).

Produ usage is essentially the idea of taking the creation of goods and knowledge out of traditional industrial lines. When it is applied to learning environments, it represents a breakaway from the industrial model of education. It also seems to share epistemological connections with social learning theories like problem-based learning and self-determined learning. The above items “outline the key capacities of effective contributors to produ usage projects” (Bruns, 2009, p. 344) and also present a framework for educators to follow when thinking about how to structure the learning environment. Through all of the individual and group activities, learners should be actively contributing to the shared knowledge production of the class. It is possible that the instructor may decide to open up the learning environment to all interested users or structure activities by asking students to participate in public projects like Wikipedia or Wikibooks (a project tangential to Wikipedia for the public creation of books). If education were to truly engage produ usage, it could encourage the ubiquitous use of social software, as Mejiias (2006) states:

Social software allows students to participate in distributed research communities that extend spatially beyond their classroom and school, temporally beyond a particular class session or term, and technologically beyond the tools and resources that the school makes available to the students. (p. 1)

It is not the intent here to suggest that all online learning must be presented and created open to the public, but the tool set is certainly available, and the possibility adds an additional dimension of authenticity to the work.

Example Frameworks and Models

Kanuka (2008) described a set of concerns that have arisen surrounding the rise of e-learning:

The growing lists of concerns include commercialization of teaching; lack of face-time between students and teachers; techno-centric models prioritized over face-to-face culture; devaluation of oral discourse/discussion practices; centralization of decision-making and service provision; concerns that complex and deep learning cannot be satisfactorily achieved without real-time classroom experience; increased technological and pedagogical uniformity; surveillance options that violate privacy policies; recontextualization of established cultural practices, such as education as a cultural discourse; and concern about the growing digital divide and downloading of costs to students. (p. 92)

These questions come from many different, sometimes conflicting, points of view. A common theme that Kanuka sees in this list is lack of a consistent teaching philosophy, or “philosophy-in-practice” (p. 92). The teaching philosophy an instructor adopts affects the types of ends achieved in instruction and frames how an instructor feels about the use of technology and the type of tools chosen. Postman (2003, cited in Kanuka, 2008) felt that “embedded in every tool is an ideological bias, a predisposition to construct the world as one thing rather than another, to value one thing over another, to amplify one sense or skill or attitude more loudly than another” (p. 13).

Notar, Wilson, and Montgomery (2005) present the formula “objectives + learning process + relationship to instructional media = cognitive learning” (p. 19) as a key to

approaching online instructional design that focuses not on the technology being used but on the interactions between the learners and the materials. In their assessment of the state of distance learning, they note that most distance learning focuses on the lower steps of comprehension in Bloom's Taxonomy. Bloom (1956) developed a learning taxonomy that outlined the cognitive steps that learners go through as they master a subject. The stages, in order of their level of understanding, are knowledge, comprehension, application, analysis, synthesis, and evaluation, and as learners go through the levels, they start at the knowledge stage and work up to the point where they can be introduced to new knowledge and evaluate it objectively.

Distance learning's current focus is often at the knowledge and comprehension level and works "well with procedural and technical training" (Notar et al., 2005, p. 18), suggesting a need to move up to the higher levels of learning in the taxonomy. Distance Learning should attempt to address the analysis, synthesis, and evaluation levels. A problem lies in the fact that "technologists are providing educators with a wide assortment of tools, but, they are not providing parameters for the design, development, and implementation of material" (p. 18). Yoking this instructional need to the type of problem-solving work that could help a student achieve the higher levels of learning, Notar et al. present a teaching model that suggests design factors for educators to choose from as they are developing a class. These are:

1. Embed learning activities in an overarching scenario.
2. Employ rich learning activities.
3. Use pictures, not text, to the extent possible.
4. Embed the data needed to solve problems in the learning context.
5. Have student provide "story" resolutions before they are exposed to "expert" solutions.
6. Support multiple links among concepts.
7. Present knowledge from multiple perspectives.
8. Use active learning techniques.
9. Stimulate the collaborative process by presenting problems so complex that students must work together to solve them.
10. Support continual self-assessment.

11. Provide support at critical junctures to push student past current limitations.
12. Expose students to expert performance.
13. Provide pairs of related stories (vignettes) to learning to establish transfer outside the macro-context. (p. 22)

A review of these options reveals that the actual choice of online tools and instructional strategies to support learning and collaboration is still quite wide open to the instructor. In fact, “there are no correct answers or combinations. The use of design factors must fit the delivery mode(s), objectives, method, content, and teaching style” (p. 22).

Thus, at this point, an instructor would still likely require professional development and training or the assistance of an instructional designer to select the tools and possibly methods for meeting the design factors selected.

Hirumi (2002) proposes a framework analyzing the types of interactions that occur in online learning. These include interactions that learners have with each other, with the instructor, within themselves, and with the instructional media. As Hirumi explains, “key interactions that can affect student attitudes and performance must be carefully designed and delivered as an integral part of eLearning” (p. 157). His framework for analyzing, designing, and sequencing online learning interactions can assist an instructor with optimizing the number and complexity of interactions, though it does not itself try to gauge what tools fit instructional needs best.

Keeping in mind the importance of not placing the technology before the instruction (Notar et al., 2005) and the various aspects of developing an interactive learning space (Hirumi, 2002), the development of an online course should begin with some of the same elements that exist in a well-planned discussion-based course. To date, much literature on distance education acknowledges the role of the discussion board at the heart of the online course. It is within the structure of conversations that the online educator can shape experiences and introduce collaborative tools that then can be used as mindtools to help students express and model their thinking. When starting to apply

digital tools to the events and activities in the online learning environment, instructors of “e-learning must take advantage of new technologies such as visualization, simulation, and modeling (Zucker & Kozma, 2003) to help increase networking and collaboration and reduce communication and psychological distancing” (McCombs & Vikili, 2008, p. 1597).

Brookfield and Preskill (2005) provide suggestions on how to approach both setting up the environment for group interactions and how to develop activities that can be used to introduce technology into the interactions. The stance taken by the authors presents what could be considered a goal for the type of environment created in an online setting:

When participants take a critical stance, they are committed to questioning and exploring even the most widely accepted ideas and beliefs. Conversing critically implies an openness to rethinking cherished assumptions and to subjecting those assumptions to a continuous round of questioning, argument and counterargument. One of the defining characteristics of critical discussion is that participants are willing to enter the conversation with open minds. (p. 7)

To lay the groundwork for such conversations to occur, Brookfield and Preskill (2005) suggest a commitment to following key dispositions as necessary to create a “classroom” ready for critical discussion: hospitality, participation, mindfulness, humility, mutuality, deliberation, appreciation, hope, and autonomy. These dispositions apply to both the instructor and the students. Through the development of such a classroom atmosphere, additional groundwork is laid to create a collaborative environment. Thus, “if the conditions for democratic, critical discussions are carefully created and respected, the students can end up learning collaborative habits” (p. 33).

Notar et al.’s and Hirumi’s approaches to designing online curriculum provide a high-level method for structuring activities and developing a self-guiding checklist. Brookfield and Preskill’s approach offers inspiration and an ideal to achieve when creating an environment for discussion and collaborative group work, along with some

key strategies to consider when designing online activities that can help learners achieve the type of learning found in the higher levels of Bloom's taxonomy. Moving on to consider the selection of online tools and the medium users will interact with, some other frameworks worth considering are Bonk's (2009) WE ALL LEARN model and Ally's (2008) model for distance learning.

Bonk (2009) presents a loose framework that attempts to organize the types of interactions and mediums that are available to 21st Century Learners. The somewhat forced WE ALL LEARN acronym stands for:

1. **W**eb Searching in the World of e-Books
2. **E**-Learning and Blended Learning
3. **A**vailability of Open Source and Free Software
4. **L**everaged Resources and Open Course Ware
5. **L**earning Object Repositories and Portals
6. **L**earner Participation in Open Information Communities
7. **E**lectronic Collaboration
8. **A**lternate Reality Learning
9. **R**eal-Time Mobility and Portability
10. **N**etworks of Personalized Learning. (p. 51)

According to Bonk (2009), these "openers" provide educators a way to view the types of digital resources and interactions that are possible through the Internet. As previously explored, vast storehouses of knowledge are available to learners online, methods for grouping people online are possible through LMS and social media tools, and with the appropriate groundwork and instructional strategies, educators have new avenues to make collaborative online learning possible.

Drawing on seminal philosophies of learning, such as behaviorism, cognitivism, constructivism, and connectivism, as well as adult learning styles, Ally (2008) presents a model that provides a tidy summary of the elements in designing an online learning environment. Dismissing the notion that placing links and digital resources online alone is learning, Ally states, "A variety of learning activities should be used to accommodate

the different learning styles. Learners will choose the appropriate strategy to meet their learning needs” (p. 36). A set of stages is introduced:

- *Learner Preparation*: where learners are given rational and connections to the materials to motivate, an outline of the learning outcomes, as well as self-assessment tools to allow learners to figure out how prepared they are for the lessons.
- *Learner Activities*: the activities that learners should reach across the spectrum of media types available to meet their preferred learning styles. Practice activities, opportunities for transfer of learning to real-life application, and chances to summarize the learning should exist.
- *Learner Interaction*: learners need to interact with the materials, but they should not be ‘overloaded’ by the interface. Learners need to interact with other learners, the instructor and “participate in shared cognition, form social networks, and establish social Presence” (p. 38).

These frameworks are heuristic in nature, simply suggestions for designing online learning environments.

Problem-Based Learning and Distributed Problem-Based Learning

When designing online activities, the frameworks above provide a guide to the design factors, interactions, social grouping techniques, and types of resources available. To help frame these aspects in an approach to online teaching, a brief exploration of the problem-based learning (PBL) approach to teaching and learning is provided, followed by a description of distributed problem-based learning, as one example of extending PBL to include collaborative learning.

PBL is an approach to teaching that has its roots in training for the medical profession going back over 40 years (Hmelo-Silver, Duncan, & Chinn, 2007; Neville, 2009) but is found throughout educational and professional fields where “real-world”

problem solving is valued. More importantly to this study, this style of learning also acknowledges the role of social and constructivist learning, making it ripe for the inclusion of online collaborative tools. As Cho and Jonassen (2002) explain:

Learning and solving problems in the real world rely on knowledge distributed throughout a community of practice. The medium of learning is social negotiation of meaning, not content as determined by some agency, so knowledge emerges in the discourse of the community. Perhaps the most important difference is that in the real world, individuals and communities learn how to do things, not about the things. (p. 2)

The PBL approach also hews closely to adult learning theories. While one would be hard pressed to find a singular definition of PBL, generally speaking:

PBL curricula comprise the following elements: (a) Students are assembled in small groups; (b) these groups receive training in group collaboration skills prior to the instruction; (c) their learning task is to explain phenomena described in the problem in terms of its underlying principles or mechanism; (d) they do this by initially discussing the problem at hand, activating whatever prior knowledge is available to each of them; (e) a tutor is present to facilitate the learning; (f) (s)he does this by using a tutor instruction consisting of relevant information, questions, etc., provided by the problem designer; and (g) resources for self-directed study by the students such as books, articles, or other media. (Kirschner, Sweller, and Clark, 2006, p. 93)

The above passage highlights where PBL relies on self-determined learners, learners who bring with them prior experiences, and requires collaborative groups that can work independently of the teacher/tutor. Additionally, PBL requires the use of problems, by definition, to express its learning strategy. In traditional PBL, the instructor carefully constructs problems and students define what they need to know through independent research (Kirschner et al., 2006).

The next step toward integrating this into the digital education sphere is to bring the PBL method entirely online. McConnell's (2006) *E-Learning Groups and Communities* offers a compelling reflection on his work in building collaborative learning groups with adult learners in the UK. As a curriculum designer and online educator, he writes extensively on what in his experience has worked and what to be wary of when

designing online learning courses. Focusing on the effectiveness of e-learning in social groups, he writes specifically of the need not to rely on the technology alone:

Collaborative e-learning groups exhibit complex dynamics and diverse learning processes and outcomes. Pedagogical designers who ask learners to work in such groups need to be aware of this. It's all too easy for teachers to include group work in a collaborative learning design on the assumption that the technology itself will support the work of the group. (p. 185)

McConnell outlines several areas of important consideration when designing a collaborative learning environment. He stresses the need for the learners to take control of their learning and the group, the creation and maintenance of identity within the individual, the importance of reflection during the learning processes, and the essentialness of peer assessment.

Again, of interest to note are the close ties of Andragogy present within McConnell's (2006) work. The underpinnings of Andragogy include acknowledging a student's previous experiences as a rich and critical resource, ensuring that the learners are responsible for the decisions in their education (including planning and assessment), making learning problem-centered, and accepting that adults respond better to internal motivators rather than external ones. When matched up with McConnell's concerns, parallels become apparent between the needs of adult learners and the promise of collaborative online education.

McConnell (2006) proposes the notion of Distributed Problem-Based Learning (DPBL). Like Problem-Based Learning, DPBL is an instructional approach built on constructivist foundations that deeply integrates aspects of social learning in which students engage with subject matter while working on rich, complex, and realistic problems. DPBL "occurs in an open adult learning context where learners, who are already professional people, work in small, distributed e learning groups and negotiate among themselves the focus of the problem" (p. 147). They may work cooperatively or collaboratively, but most important is that there are no specific predefined learning

outcomes; in fact, the focus of the learning is chosen by the students. Writes McConnell, “The groups are following a long tradition of adult learning which supports openness and exploration” (p. 147).

The need for creating and maintaining an identity is tied closely to the well-being of groups. While McConnell (2006) acknowledges that there are indeed extrinsic motivators, such as grades, he stakes a great deal of the success of online learning groups on the group itself. “They (the group) themselves take a great deal of responsibility for managing their focus, process and production of the final product. They participate fully and prodigiously because they see themselves as a community” (p. 160). The functioning of a community requires its members to collaborate and work together, and most importantly, trust each other. Establishing identity in DPBL primarily occurs during discussions in the preliminary stages collaboration. The discussion encompasses the integration of the student’s identity, considering both their professional identity and identity as a learner. In this, the students are working to create a place where there is intersection between both realms. McConnell draws on the social learning work of Wenger’s (1998) *Communities of Practice* when he writes, “Meaning making is negotiated through the process, relations, products and experiences of the community” (p. 165).

The extrinsic incentives to collaborate and work together, such as assessments that reward collaboration, are also central to keeping the group of students together. McConnell (2006) suggests turning assessment over to the groups themselves. Peer assessment is based in democratic practices; it helps further break down the teacher/pupil power dynamic and, maybe most importantly, reduces the burden on teachers to assess. In peer assessment, “the expectation is for students to engage in helping each other develop, review and assess each other’s course work” (p. 93). Every student in the class is required to give feedback to their peers in addition to receiving it. If assessment is seen

as a part of the communities work, then it should not devolve into competition or feelings of powerlessness, which hinders collaborative work (McConnell, 2006).

Grouping Activities

One of the dimensions that affects group work on line is the ability to have open and critical discussions (McConnell, 2006). “The process of group work is related with the participants’ abilities to develop in-depth discussions, to question and contribute to the group work” (Oliveira, Tinoca, & Pereira, 2011, p. 1349). Participants need to establish social presence and a degree of “openness” between each other. Integral to the development of an online collaborative approach to adult education is the art of developing and maintaining student groups, something that spans both the in-person and online groupings, but it is made harder in the online environment as there is a lack of visual and auditory clues in the interactions that occur between participants as opposed to the in-person environment (Anderson, 2008).

As discussed previously, Problem-Based Learning is often conducted in small groups, with students either assembled by the instructor based on observations and assessment of students’ strengths based on ideas informed by ZPD or diverse points of view (Brookfield & Preskill, 2005; Gunawardena et al., 2006) or grouped around shared interests (Brookfield & Preskill, 2005; McConnell, 2006). As Wang (2010) points out, online collaboration has many facets to consider, from designing the groups to assessing their output:

Many challenges exist in the instructional design process of collaborative learning. One is how to effectively coordinate group members’ individual efforts and build on their strengths so that they all work towards the same direction (Barron, 2000). Another is how to closely monitor the learning process and fairly assess students’ individual contributions. Teachers cannot arbitrarily assume that each member makes an equal contribution to the group work and hence give the same marks to all members. Such challenges must be deliberately addressed so that effective collaboration can take place. It seems that technologies have great potential in addressing these issues. (p. 1270)

There are many ways to approach groupings, but some specific strategies may be helpful in the development of online courses. Drawing from the literature around facilitating in-person discussions as well as best practices in CSCL, the following is a very selective, but representative list of approaches to arranging group activities. To begin with, some of the ideas behind the creation of discussion and discussion groups presented by Brookfield and Preskill (2005) can be useful at this stage of development. By creating an atmosphere that fosters the dispositions of hospitality, participation, mindfulness, humility, mutuality, deliberation, appreciation, hope, and autonomy, it sets the stage for having an environment that fosters critical discussion. Meyers (2008) offers that the best way to create to an online environment that sets the stage for transformative learning with adults is to:

(a) create a safe and inviting environment; (b) encourage students to think about their experiences, beliefs, and biases; (c) use teaching strategies that promote student engagement and participation; (d) pose real-world problems that address societal inequalities; and (e) help students implement action-oriented solutions. (p. 220)

Meeting these goals in the development of the course requires the facilitator to consider how to increase trust, being a “guide on the side,” examining assumptions through critical reflection, considering alternate perspectives on issues (Meyers, 2008), treating students as adults, acknowledging them as co-creators, and including them in setting up the rules for discussion in the course (Brookfield & Preskill, 2005). Establishing such an environment can help pave the way (though by no means guarantee) for good discussions and the development of groups.

Techniques and Tools

The next step in this literature review is to take a look at some of the online collaborative tools that are available to online educators and explore some ways in which they can be used to support the development of an online environment that takes into

consideration the needs of adult learners and the benefits of social constructivist learning. It is important to review the tools and techniques to better understand how to provide faculty with the tools that support the activities and methods of teaching that work best with 21st century online learners.

Sequencing and Analyzing eLearning Activities

When designing an online experience for their students, facilitators may, in addition to considering how to instill and harness the concepts of produsage, also want to take careful stock of the types of interactions the learners will have between each other, the course materials, and the learning environment. In this respect, Hirumi's (2002) interaction framework is a useful tool, as he states, "It is the ability to initiate and facilitate such interactions that often distinguishes a good instructor from a bad one" (p. 141). The problem, though, is not so clear-cut; as noted previously, the time and training often available for instructors to become proficient online are sometimes in conflict with the demands that they do so, something that Hirumi addresses:

Without sufficient time, training, or support, educators had little choice but to rely on what they know best (i.e. teacher-directed methods). The problem is that key interactions are not often planned as an integral part of traditional classroom teaching materials because instructors typically facilitate such interactions in real time based on their expertise and intuition. As a result, key interactions necessary to stimulate eLearning are frequently missing when traditional classroom materials are posts online to promote elearning. (p. 148)

Another issue that Hirumi (2002) brings up is that often when designing eLearning activities, educators do not ground themselves in an epistemological perspective, which makes it difficult to hone their use of technology. In response this need, he offers the following set of overarching steps in the planning of an online activity:

- Step 1—Identify essential experiences that are necessary for learners to achieve specified goals and objectives (optional);
- Step 2—Select a grounded instructional strategy (level III interaction) based on specified objectives, learner characteristics, context and epistemological beliefs;

- Step 3—Operationalize each event, embedding experience identified in Step 1 and describing how the selected strategy will be applied during instruction;
- Step 4—Define the type of level II interaction(s) that will be used to facilitate each event and analyze the quantity and quality of planned interactions;
- Step 5—Select the telecommunications tool(s) that will be used to facilitate each event based on the nature of the interaction and;
- Step 6—Analyze materials to determine frequency and quality of planned Learning interactions and revise as necessary. (p. 151)

These steps give the educator a way to conceptualize and sequence an elearning experience. His insistence that an epistemological model is chosen is a key aspect that is often overlooked by educators and thus appears as one of the earliest steps in his framework. It is important to note that this is a heuristic tool and it doesn't necessarily suggest the number or types of interactions; rather, it is a planning tool that asks the instructor/designer to think about the number and quality of interactions. Also, as Hirumi (2002) warns, it is not the frequency of interactions that determines the quality of an eLearning activity. In fact, even the most well-intentioned plan can become problematic:

Too few, too many, or poorly designed interactions can result in bored learners and instructor dissatisfaction, inadequate learning, and insufficient performance, requiring additional time, effort and expertise to revise instruction-resources that could have been spent on other projects. (p. 156)

While this model offers the educator an organizational tool, it is in step 5, where they must select and appropriate tools to support the activities, it seems, that instructors using the model could benefit from a deeper level of specificity: namely, what type of tool is appropriate for the determined interaction, and what type of activities could the tool support best. During this step, attention should be paid to making sure the tools and activities support adult learners properly, ensuring that the tools and activities will be meaningful to the adult learners. Hirumi (2002) writes:

The overuse or misuse of interactions can lead to frustration, boredom, and overload. Students may become dissatisfied if they perceive online interactions as meaningless busy work. Too many interactions can also make it difficult for learners to discern the relative importance of content

information and each interaction. Too many interactions may also overwhelm the instructor. (p. 154)

Hirumi's model was developed in 2002, several years before the concept of Web 2.0 came into being, and while many collaborative tools were available in nascent forms (i.e., the bulleting board, threaded discussion, email, IRC chat, etc.), the current crop of online collaborative tools that is the concern of this study may be able to collapse the number of interactions that may have been necessary with the more rudimentary tools. For example, there are social bookmarking tools that allow users to comment and have asynchronous discussions directly on bookmarked websites instead of requiring multiple open screens, and cutting and pasting links to discussion boards, reducing some of the complexity of online discussions and group research.

Creating meaningful interactions The reason to analyze the interactions between learners and the medium is to ensure that the interactions they are having are meaningful ones (Hirumi, 2002; Woo & Reeves, 2007). One can interact on elements in an interface or a website and it can have no meaning, but the hope is that, within eLearning, all the designed interactions are ones that serve the learning. Essentially, Woo and Reeves (2007) state:

When interaction has a direct influence on a learner's intellectual growth, we can say the interaction is meaningful (Hirumi, 2002; Vrasidas & McIssac, 1999). In an online learning environment designed on the principles of social constructivism, meaningful interaction should include responding, negotiating internally and socially, arguing against points, adding to evolving ideas, and offering alternative perspectives with one another while solving some real tasks. (p. 19)

Hirumi's (2002) framework outlines three-levels of interactions that instructors need to consider when developing interactions for learners' online learning experiences. The framework essentially asks the course developer to enumerate the amount and types of interactions that learners will experience during a learning activity. Level one is "learner-self interaction" (p. 143), which occurs within learners to help monitor and regulate their own learning. Level two is "learner-human and learner-non-human

interactions” (p. 143), where the learner interacts with various human and non-human resources like video, readings, and rich media. Level three is “learner-instruction interaction” (p. 143), which consists of activities developed within the lower two levels to achieve a learning outcome. The model does not adhere to a particular educational philosophy; thus, behaviorists, cognitivists, and social constructivists alike can find uses for it. What it does do is help the curriculum designer think about how certain tools and activities may fit together to meet a desired learning goal.

Within Hirumi’s model, specifically, in the second level, Vygotsky’s (1978) Zone of Proximal Development (ZPD) is a key element. Instructors should be cognizant of how the planned interactions help the learner to both self-regulate and advance their knowledge when working with peers and the learning environment. Goos, Galbraith, and Renshaw (2002) explain how to extend the idea of ZPD in socially constructive environments:

This view of the ZPD suggests there is learning potential in peer groups where students have incomplete but relatively equal expertise—each partner possessing some knowledge and skill but requiring the others’ contribution in order to make progress. (p. 95)

An important distinction is that in this concept of ZPD, it is not a much more advanced peer or instructor who is leading the learner; rather it is the “interaction that occurs when students with similar levels of competence share their ideas in order to solve jointly a challenging problem” (p. 196). Within the produsage environment, it is possible that interactions can be designed in ways that encourage experimentation with ideas and give students the confidence to “critically re-examine their own assumptions” (p. 196), which is a key element for adult learners.

Gunawardena et al. (2009) arrive at a similar explanation of the power and purpose of Web 2.0 tools in capturing collective intelligence in education:

Web 2.0 applications such as wikis provide the technological support for groups to move toward collective intelligence in a learning environment, a

shared space in which a group of individuals can develop community, discuss an issue of interest, and reflect on practice. (p. 7)

Creating a Prodsusage Environment

There is a strong connecting ethos between produsage and Andragogy; concepts behind the self-determined learner, the collaborative learner, and the constructivist learner are deeply embedded in both approaches. Tools like wikis, social bookmarking, podcasting, RSS, and YouTube, tied together with publishing platforms like blogs (Wordpress, Blogger, Tumblr) that aggregate and promote ideas, make for a powerful toolset for the online adult educator. While there is plenty of room and need for the quiet solitary study of books and fixed material and personal reflection, the effective use of online social tools provides a platform for shared knowledge creation and access to multiple perspectives and constructive criticism (Bruns, 2009).

There is an important distinction between some of the elements that make “produsage” successful in uncontrolled environments and the more contrived environment of an online class. Groups in online learning typically do not form organically, and are also shaped by external forces (assessment, grades) in addition to intrinsic ones (reputation, self-gratification), and careful attention needs to be paid to the development of the groups and some structure for the activities provided. This, of course, is a little different from what Bruns feels makes a produsage community successful, but ultimately it should lead to the same end. McConnell (2006) explains how he approaches group development in his online courses and,

with the deliberate, formal introduction of collaborative and cooperative processes, strategic scaffolding and clear work phases, discussion and negotiation are more focused. Discussion is still very high but occurs within well-defined time periods after which everyone involved moves on to the next phase of their work. (p. 193)

The balance of power is a little different in the online course than on the wild Internet, as there is a defined teacher whose role is of a fluid nature. McConnell (2006)

uses the term “tutor” throughout and suggests that the tutor’s role is to both be a member of the group, and to be a decision maker only when necessary. It is important that the tutor is not perceived “to be a unilateral decision maker” (p. 194). This is akin to the notion of teachers becoming lead producers (Bruns, 2009).

Another step in developing an understanding of the needs of adult learners is developing an online space that can effectively support collaborative group work and accommodate instructional scaffolding and peer assessment.

Bates (2005) warns us that technology choices need to be driven by the needs of the learner and not the novelty of the technology. Coming from the perspective of a technology administrator in higher education, he also sounds the alarm to the issues that picking and choosing between hosts of officially sanctioned and supported tools and publically available tools can be problematic to the institution. However, this is just how the Web 2.0 eco-system seems to work and engenders the “different parts of the organization start(ing) to build a patchwork quilt of different software and educational applications” (p. 49).

In developing online, collaborative, adult learning environments, an integral piece is considering the tools that will fit the learning goals at certain stages in the course and project work. To help us continue to structure discussion of the proper tools to support online collaboration and learning, we turn back to McConnell’s (2006) description of the DPBL method.

Within the DPBL model, McConnell (2006) has identified the phases that learners go through as negotiation, organizing, production, and reflection. Within these phases, certain tool types with various affordances, along with grouping techniques, can be used to flesh out the framework for guiding learners without controlling learning. DPBL works well to define the types of online collaboration tools, because along with the concept of “produsage,” it works outside of predetermined activities and relies on the contributions of dedicated collaborating learners. As McConnell notes, this approach is

not the usual PBL approach where a problem is defined by the teacher and given to the student as their starting point for learning. In this traditional model, students acquire knowledge and skills through staged sequences of problems presented in context, together with associated learning materials and support from teachers. (Boud & Feletti, 1997, in McConnell, 2006, p. 147)

Thus, the discussion of DBPL here is to provide a way to organize, at a high level, the types of learning activities and interactions that could be within online learning groups.

The Tools

Jonassen (1996) defined the term “mindtools” as “computer software applications like databases, spreadsheets, semantic networking programs, expert systems, systems modeling tools, microworlds, hypermedia authoring tools, and computer conferencing, that enable learners to represent what they have learned and know using different representational formalisms” (p. 3). An underlying assumption on mindtools is that they do not make the learning easier. In fact, they cannot be used without thinking deeply about the content that is being learned.

In defining Mindtools, Jonassen (1996) groups the various tools under a set of headings that best categorizes their use in learning. The following headings refer to technologies that were not necessarily collaborative and most likely not online, but it still serves as a useful method for grouping tools:

- **Semantic Organization Tools:** database, concept mapping
- **Dynamic Modeling Tools:** spreadsheets, expert systems, systems modeling tools, micro worlds
- **Information Interpretation Tools:** searches on the Web, web sites
- **Visualization Tools:** tools that go beyond paint and draw by scaffolding or supporting the content
- **Knowledge Construction Tools:** hypermedia, conversation tools

Extending the concept of mind tools is Cho and Jonassen's (2008) own definition of meaningful learning, which contains a component of cooperation between learners. This concept, which requires social interactions in learning, links the definition of mindtools with online collaborative tools and their application in online learning. Kirschner & Erkens (2006) also refined Mindtools to include a social component, arguing that Mindtools, when used collaboratively, "are meant to facilitate and scaffold shared processes of cognition in order to achieve a common goal or product in a group or community of learners" (p. 203). The authors also add several tools to Jonassen's headings, indicating that the classifications and tools are something that can change and grow as tools and methodologies evolve.

Since the original definition of Mindtools, the Internet has grown, the Web has become more powerful, and many of the types of tools Jonassen was referencing in 1996 have migrated online. For example, well-established tools like word processors, spreadsheets, concept mapping, databases, and hypermedia authorizing tools exist in the form of online services where students can work collaboratively on projects. Students across courses, educational institutions, the country, and the world can work together editing concept maps and working out ideas. Additionally, new distribution tools like podcasting make it possible to broadcast ideas to anyone, anywhere. Integrated with DPBL and other social learning approaches, these can be powerful tools to support meaningful learning.

The following is a look at some of the basic tool types that are currently available to use with online learners. The tools are organized under the headings provided by Jonassen, with some additional subcategories added under "Knowledge Construction" suggested by the growing nature of collaborative use of the tools.

Knowledge Construction Tools: Discussion

Discussion boards. A stalwart in the arsenal of the online educator is the discussion board. The threaded discussion is a very useful tool, and choosing to use it makes perfect sense, especially in the beginning phases of the course. The discussion board is well suited for this work:

The process of warming up and forming the learning community can include a mix of synchronous and asynchronous communication. The goals should be that learners: 1) get to know one another and build relationships, 2) develop comfort with the technology, practicing the skills of online communication and conversation, 3) safely practice revealing themselves, and 4) reflect on their learning possibilities in this environment. (L. Smith, 2005, p. 101)

Levine (2007) summarizes the strengths of the discussion board, citing that it is not only good for the introduction and welcoming to the community, but it can be used for many other aspects of the course as well, including (but not limited to) establishing the rules of the course, posing meaningful questions and problems, encouraging reflection, and summarizing key ideas. He writes, “Building on a constructivist view of learning, it can stimulate an individualized form of learning at the higher levels of the cognitive domain. It can provide learners with exceptional opportunities for self-expression and reflection” (p. 73).

Discussion boards are germane to the LMS, and their use is well documented in the literature. We will turn our focus now to the newer Web 2.0 collaborative tools that can also be used in conjunction with or in lieu of the discussion board.

Contextual discussion tools. Some tools that will be explored under the other categories are social bookmarking and annotation tools like Diigo and, to some extent, Delicious. They qualify a quick mention because they feature the ability to have conversations placed directly into web pages. While not as robust as a full-featured discussion board, the ability to place a conversation on top of an item being discussed, or in the context of a collection of bookmarked sites, rather than trying to place a link,

image, or textual description, can provide for a richer and more contextualized conversation.

Knowledge Construction Tools: Publishing and Broadcasting

Blogs. The blog is a well-established web site publishing format; many different blogging platforms exist, such as Blogger, Wordpress, and integrated into most LMS. A blog provides a simple way to post web content, and the entry is automatically date/time-stamped. The blog administrators can decide to open up the blog posts to commenting and, in some cases, threaded discussions.

Citing ease of publishing and, more importantly, more distributed authorship, the blog has become an effective tool for Web 2.0-minded educators (Lin, et al., 2005; McLoughlin & Lee, 2007; Oliver, 2007). When coupled with the notions of produsage, such as open participation, communal evaluation, unfinished artifacts, continuing process, and common property (Bruns, 2009), the affordances of the blog as an integral part of the crafting of online experience become more apparent. The blog's focus on individual postings, while inviting and growing with social participation, is intriguing:

When thinking of integrating collaborative knowledge-building, the most insidious concern is whether most students have the motivation and ability to construct their own knowledge. The blog provides the field where the decentralized authorship can be realized, and creates more comfortable environment where students can be motivated to make reflections and comments. (Liu et al., 2005, p. 1)

While a mainstay in distance learning is the threaded discussion board (Bates, 2005; Ngwenya, Annand, & Wang, 2004), this format allows for discussion and cultivating conversation, and it is a less personal space than a blog (Lin et al., 2005; Williams & Jacobs, 2004). Considering the importance of personal reflection in adult education, the use of a personal learning blog affords both the reflective place and social interaction space. For example, tools like blogs can support what Boyd (2007, in Lee, M.J., McLoughlin, C., and Chan, A., 2008) says are the activities that make up learner-

centered instruction: “(i) support for conversational interaction; (ii) support for social feedback; and (iii) support for social networks and relationships between people” (p. 665). Liu et al. (2005) are in agreement, writing, ”Comparing with students’ discussion on course forums in the course website, talking something in their own blog was more a personal thing, which broadened the flexibility and space for them to reflect and discuss in an easier way” (p. 3).

There are several different approaches to setting up class-related blogs. They can be integrated in the LMS or a loose collection of personal blogs linked together using commenting, blog rolls, permalinks and trackbacks. In this manner, blogs can become a network of interlinked personal spaces that invite collective use. Most blogs also offer the ability to output RSS feeds, which allow users to subscribe to each other’s blogs.

In one sense, a blog is a simple tool, but, when structured with collaboration in mind, it can become a powerful knowledge construction tool. Active learning and problem-based learning activities can be structured around the blog, especially when combined with other web- and multi-media-based tools. A blog tool’s collaborative capabilities open up new learning possibilities.

Oliver (2007) mentions that, in his set-up of the course being studied, he did not require students to comment to each other’s blog postings. However, he writes, “Peer review of blog entries might increase the number of reflections entered, however, as recommended by one teacher who suggested the course should require fewer individual blog entries overall in lieu of more reading and reflecting on classmates’ blog entries” (p. 56). Reflecting on McConnell’s (2006) notion that “great care has to be taken to foster collaboration in the learning sets, and to produce positive incentives that encourage support and reward the act of collaboration” (p. 70), as well as Bruns’s (2009) explanation that a great motivating force in produsage is meritocracy and the sense of collective purpose, it seems that blogs can be powerful learning tool if activities using them are structured well.

RSS and podcasting. Heilesen (2010) performed an extensive literature review on the uses and effectiveness of podcasting in education. He indicated a lack of longitudinal studies and a paucity of well-designed studies to measure podcasting's effectiveness, but did conclude that, regardless of the measurable effectiveness, podcasting has other properties that make it a viable force in higher education.

Podcasting helps extend the classic benefits of net-based learning, i.e. independence of time and place, as well as easy access to materials also to on campus teaching, as it turns 'blended' through the extension of the classroom on the Internet. These are demonstrable advantages, and they are valued in this age where the availability of choice in all aspects of life apparently is becoming a natural right. (p. 1065)

Some of the ways that podcasting is being used in educational settings vary from organizational tools, to lecture replacements/supplements, to student-generated content. Heilesen (2010) notes that the "positive effects, however, are not necessarily related to the audio visual medium, but rather to well-known techniques for improving academic performance, such as active engagement and revisions" (p. 1066). Regardless of the measurable effects, the ability of the media to engage students in new and effective ways is a compelling reason to further explore its use.

Before delving too far into podcasting, a quick primer on what it is may be helpful. Podcasting is an audio or video file attached to an item in an RSS feed. An RSS feed is a standardized format for assembling a list of information, usually consisting of a date stamp, a title, and a little bit of descriptive information. While there are many ways to create and distribute podcasts, the simplest may be in a blog format or publishing it to a service like Apple's iTunes University program. Also, most blog platforms allow you to upload and attach a media file to a post, which in essence creates a podcast episode. This entry can appear on the blog site and be shared as a series as an entry in an RSS feed. Using the blog also affords a space where users can come back to post comments and have discussion based on the particular podcast in the series.

Since the RSS feed (which has multiple definitions, but often is noted as “Really Simple Syndication”) is a standardized format, “aggregator software” can read and display the information in various ways. An aggregator can be as bare-bones as a web browser with the RSS feed’s web address (URL) bookmarked, or in tools like Google Reader, which allows you to make custom sets of news feeds. Feeds can also be subscribed to in a Learning Management System, where students could see a list of entries in pane on in the LMS’s interface and can click to listen/watch the podcasts. Heilesen (2010) notes that students often listen or watch podcasts at their computers and not “on the go” through their mp3 players. However, another viable way to distribute podcasts is through iTunes, the software from Apple that allows one to subscribe to RSS feeds and download attached media to desktop and mobile players. The burgeoning mobile field also provides outlets for RSS and podcastings, new tools like the iPad have RSS aggregators that can be used almost like newspapers to read and listen to content, and direct access to subscribe to feeds in iTunes is available directly through the iPad itself.

At this point, it may be important to stop and consider that a great deal of what was just discussed can actually happen outside of the course LMS and away from the computer. Mobile technology and podcasting can allow one to take the course materials into the context of daily life, into the car, on a walk with the dog, and so on. Mobile technologies also make it possible for students and instructors to create the podcasts while away from the computer, extending instructional possibilities anywhere, anytime.

Embeds: Flickr & YouTube. Another way to augment produsage of Web 2.0 tools is embedding media via the HTML embed tags into blog posts. The embed tag is a standard method of including media into web-based tools from external sources, but unlike a podcast, which is typically clicked on and listened to or downloaded to a program like iTunes, the material is viewed in the context of the post. This usually means that subscription through iTunes U, which expects that the attached media is a

downloadable video or audio format, is not possible, but rich RSS aggregators will usually have no problem displaying the content in-line. Web 2.0 tools in general embrace multimedia and provide many avenues to expression and content creation. According to McLoughlin and Lee (2008):

Text alone is not always preferred mode of communication, as web-based multimedia production and distribution tools incorporating rich audio (podcasting, Skype), photo (Flickr) and video (YouTube) capabilities are growing, and provide engaging two-way experiences for users, while empowering them as “prosumers” of the multimedia content. (p. 665)

Flickr, for example, is a community-based service revolving around photography. Users create accounts and upload, tag, and caption their images. They can also add comments to their own and others’ images. Comments can be posted blog style, below an image, as well as in context, placing notes upon the image. Users can also “tag” the photos, collections, and groups to create aggregations of related photos. Utilizing these categorization methods, users can create “streams” of photos, which are essentially feeds with images attached that can be embedded into blog postings, creating photo essays.

YouTube and other video services are content repositories that offer, like Flickr, places for commenting, tagging, and getting embeddable versions of the video to place in a blog post.

Knowledge Construction Tools: Productivity

Google Docs and word processing. The modern online word processor can be a hybrid of both a hypermedia authoring environment and traditional word processor. Within a word processing document, students can easily rearrange and outline ideas, and can paste in multimedia like images, sound, and movie clips. Google Docs takes the concept of a word processor, spreadsheet, presentation, and sketching tool and turns it into a collaborative endeavor. Students can share their documents with others, allowing them to edit or simply view their work. With a tool like Google Docs, students can collaborate on their work, creating outlines and reports.

In addition to the word processor, Google Docs also contains tools for spreadsheets, presentations, and drawing. All components have collaborative capabilities, making it a very powerful tool for not only knowledge construction, but also presentation, aggregation, and visualization. The various tools in Google Docs will appear throughout the tool descriptions.

Wikis. A Wiki is an online collaborative tool that is designed to allow users to contribute socially to the construction of websites. Bruns (2009) uses Wikipedia extensively in his discussion of produsage as an example of a world-editable document that has been constructed by anyone who feels that they have information to share on a topic. Wikis are now commonplace components in learning management systems, and there are services available for no or low cost to educators. Unlike Google Docs, a Wiki is website-oriented and affords the integration of rich media and creation of linked pages. Jonassen (2008) writes that the Wiki environment allows for a great deal of critical analysis as students “evaluate the ideas being co-constructed” (p. 107).

Information Interpretation Tools

Social bookmarking, tagging and annotation. Tools like Delicious and Diigo are website bookmark aggregators that allow users to share and co-collect websites. Both, at a basic level, allow users to create accounts to store bookmarks of sites that they collect as they use the Web. Both allow users to create, organize, and comment on bookmarks. Both, too, have their own more advanced community features that make them compelling tools for research and discussion in online courses.

Other tools like Flickr and Voicethread allow users to create media-rich slideshows and gather users’ annotations and comments. This type of tool server almost as a combination of the social bookmarking and blogging platforms, as it combines the presentation with a podcast and threaded discussion tool.

Content aggregation and annotation tools can be useful to both ad-hoc learning groups and solitary learners, and each caters to a different aspect of the web medium. Both have interesting and diverging uses; however, one thing that they have in common is the utilization of tagging, or folksonomies. As tool for use in the initial stages of online collaboration and learning, tagging can be an interesting and thoughtful way to present identity, research topics, and explore online environment.

Bruns (2009) describes the act of tagging content as creating a shared knowledge structure. He describes it as a

decentralized process of produsage, then, but the object of this produsage are no longer information or knowledge themselves, but knowledge structures, structures of knowledge categorization—a new, fluid, dialogic, pluralistic form of user driven, user generated, prodused content taxonomies. (p. 181)

Using filters and searching, these knowledge structures can be drawn upon for other uses. One simple approach is to generate RSS feeds from the tagged content, or use Web 2.0 tag clouds to express the frequency of tags. Tag clouds are visual representations, usually indicated by a block of the tags with frequency denoted by font size and weight.

Shirky's (2008) discussion on group size also underscores the importance of aggregating, annotating, and tagging research in learning groups. He writes:

Small groups are thus better conversational environments than large ones and find it easier to engage in convergent thinking, where everyone comes to agree on a single point of view. This is one of things social tools don't change about group life—small groups are more effective at creating and sustaining both agreement and shared awareness. (p. 267)

It is through the meta-tagging of information, in programs like Delicious, Diigo, Flickr, and many others of the Web 2.0 persuasion, that these learning groups can aggregate their knowledge into knowledge structures.

Visualization Tools

Jonassen (1996) wrote:

We take in more information through our visual modality than any other sensory system, yet we cannot output ideas visually, except in mental images and dreams, which cannot be shared visually except using paint/draw programs. While it is not yet possible to dump our mental images directly from our brains into a computer, a very new and growing class of visualization tools are mediating this process by providing us tools that allow us to reason visually in certain areas. Visualization tools help humans to represent and convey those mental images, usually not in the same form they are generated mentally, but as rough approximations of those mental images. (p. 7)

Some visualization tools that exist online and have collaboration capacity are concept mapping and drawing tools.

Concept mapping. The concept map allows students to model concepts and interrelationships in a spatial manner. They use “knowledge structures” to create “semantic networks” that represent information as blocks and links as lines to elucidate the connections between concepts and their relationships (Jonassen et al., 2008). Online, there are several versions of tools like this that allow students to develop concept maps out of icons, text blocks, hyperlinks, and multi-directional connections. Such a tool can be used for brainstorming, organizing content, and showing the connections between items. Again, the collaborative aspect strengthens this tool’s role in produsage and online collaboration. Some examples include Webspiration and Google Draw.

Google Docs: Spreadsheets & Draw. Jonassen (1996) points out that spreadsheets are primarily made for working with calculations within a matrix, and the matrix can also be used to organize information. A strength of spreadsheets is that they can help with recognizing patterns, classifying, identifying assumptions, and finding sequences. While he specifically is addressing quantitative information, it may be possible to use some of these qualities with qualitative information, like looking at the frequency of user-generated tags or creating sequences or models to support learning.

Google Draw lets students create images in their browsers that could be used for anything from concept maps to sketches of ideas to masterful works of art. Again, a collaborative component makes it a powerful tool for learning.

Mapping, mash-ups, and other tools. These are just a small sampling of the types of tools available to online educators. Other new hybrid and entirely new types of tools are being developed continuously. Some examples are “Google Earth,” which takes the concept of the globe and adds produsage capabilities. There are also some efforts such as “Wikimapia” (<http://wikimapia.org>), which makes it possible to work directly online with the mapping data, adding and editing points of interest and information as an embedded wiki entry (almost like a post-it note) to areas of the map. A tool like the UNESCO’s World Heritage App for the iPad and its own website (<http://whc.unesco.org/>) allows users to explore on the map interface places of historic and natural importance.

Additionally, these map tools represent the idea of the mash-up, where two or more datasets or representations of the data are pulled together to create a visualization of the data.

Some of the specific tools mentioned above are in a sense difficult to include in a study, as they are ever-evolving and have unpredictable shelf lives. Thus, consideration and mentions of specific tools will be made, but only for descriptive reasons; attempts have been made to include specifically named tools into broader categories with their uses enumerated. It is hoped that the instructional strategies proposed are more important than the actual tools used. If a particular tool no longer exists, chances are good that another will replace it and the pedagogical strategies used are flexible to accommodate other technologies.

Setting up the Environment

As demonstrated, there are many choices available to educators concerning the setup and use of learning tools for their classes. LMS like Moodle, Canvass, and

Blackboard contain personal blogs for all students that could be utilized, students can sign up for Google's Blogger, and colleges could also opt to use a system like Wordpress or Drupal. Additionally, instructors could use a self-contained social networking service like NING.

One compelling reason to stick to the tools in an LMS like Moodle is that if it is a platform supported by the institution, student and instructors should already have accounts that work within the school's network. As soon as outside platforms are utilized, a host of issues need to be addressed. Oliver (2007) presents a succinct rundown of concerns about using systems other than those that are part of the college's infrastructure, such as:

- Conflict with the 1974 Family Educational Rights and Privacy Act (FERPA). He suggests that course facilitators email a consent form to participants when assignments are conducted on tools outside of the school's network.
- Instructors must "also consider the ethical implications and be prepared to teach their students appropriate behaviors" (p. 60), including copyright, misrepresentation, and getting consent when transmitting "likeness" information.

Choosing almost any of the collaboration tools mentioned in this study has both technical and policy considerations. Plus, there is an obvious tension that exists between the open ideals of produsage and the considerations of privacy and exposing student learning publicly. There are also many compelling reasons to work outside of an LMS structure, one of which is that it allows the instructor (or the students as a collective) to explore and use tools they feel fit their needs best. In a sense, this underscores a point of Bruns's (2009), that educators need to model and teach the rules and responsibilities of being a produser, "socializing participants to community values and needs in order to ensure future contributions are more closely and directly aligned with the community's interests and goals" (p. 214).

Moving beyond tools, the proper structuring of activities and laying ground rules for usage come in to play. Anderson (2008) notes that “learners can, of course, interact directly and spontaneously with any content that they find, in multiple formats and especially on the Web; however, many choose to have their learning sequenced, directed, and credentialed through the assistance of a teacher in a formal education system” (p. 60). This suggests that, while a good deal of educational resources are available for students, and perhaps a confident self-directed learner can make effective use of them, there still exists a well-documented need for structuring the online environment. Essentially,

there is no single best media of online learning, nor is there a formulaic specification that dictates the type of interaction most conducive to learning in all domains and with all learners. Rather, teachers must learn to develop their skills so that they can respond to both existing and emergent student and curriculum needs. Teachers can do this by developing a repertoire of online learning activities that are adaptable to diverse contextual and student needs. (p. 66)

In order to do this, administrators of online learning programs need to take many, often competing factors into consideration when evaluating and implementing the tools that their faculty and students will use to learn online. An evaluation of many possible factors follows in this study, which asks what influences the decisions that lead to the tools that online programs utilize.

Chapter III

METHODOLOGY

Introduction

This qualitative study employed a non-experimental mixed methods approach beginning with a quantitative phase, followed by a qualitative inquiry phase, to better understand the factors that influence selecting online platforms and tools. Starting with an initial online survey, followed by a set of interviews, a phenomenological approach, which helped to generate connective themes through the subjects' experiences, led to a final analysis that combined both sets of data. For this study, 30 administrators of online learning in higher education institutions from throughout the United States were surveyed, and after a review of the results, follow-up interviews were conducted with a selected sub-group of 5 participants. Together, these two sources of data provide a window into the decision-making processes and factors that influence the selection of online learning platforms and tools.

Mixed Methods Study Design

Mixed methods research design is often described as an approach that allows researchers to build on the strengths of both qualitative and quantitative research methods. Methodologies expert John Creswell (2015) writes, "this collective strength provides a much better understanding of the research problem than either form of data alone" (p. 2).

Mixed methods studies can be set up in a number of ways; some approaches favor the quantitative, others the qualitative data, and their ordering impacts how the study is conducted as well as the outcomes (Creswell, 2015). This study uses an “explanatory research design,” where a qualitative inquiry follows an initial quantitative data collection stage, with the idea that the qualitative inquiry is used to explore further information that has been collected and analyzed in the quantitative phase. The strength of this model is that it uses the later qualitative research step to help explain the findings in the quantitative survey, ultimately providing a richer explanation of the survey findings.

Johnson and Onwuegbuzie’s (2004) description of the value of mixed methods is salient:

Today’s research world is becoming increasingly interdisciplinary, complex, and dynamic; therefore, many researchers need to complement one method with another, and all researchers need a solid understanding of multiple methods used by other scholars to facilitate communication, to promote collaboration, and to provide superior research. (p. 15)

The researchers also mention the inexact approaches of mixed methods, acknowledging that “much work remains to be undertaken in the area of mixed methods research regarding its philosophical positions, designs, data analysis, validity strategies, mixing and integration procedures, and rationales, among other things” (p. 15). However, recent trends in mixed methods research suggest that exploring phenomena through a mixed methods explanatory approach provides a breadth to the study that a single method cannot.

Mixed methods research is an active and evolving practice, with an ever-growing bibliography of methodology books, academic journals, and an increasing numbers of published research building upon current and emerging mixed methods designs (Creswell, 2015, 2016). The field of mixed methods has spawned approaches to inquiry such as quantitatively dominant mixed methods designs, qualitatively dominant mixed methods designs, pragmatic mixed methods designs, and transformative mixed methods

designs (Mertens et al., 2016). These researchers also suggest some more influential changes in mixed methods with the availability of big data and new technologies, for example, data visualization, which can “provide new insights not possible with data restricted to statistical results or words” (p. 224).

In this study, a mixed methods approach is used to explore the experience of administrators who are leading online learning efforts. The quantitative results provide a broad picture of the phenomenon, which in turn helps in the organization of the qualitative sample by highlighting which subjects to approach for further interviews. This approach is one of several supported by Creswell (2013), as he explains, “Choices for the researcher include following up on participants with certain demographics, expanding the investigation to explain important variables (or variables that surprisingly turned out to be non-significant), and looking closely at outlier cases from the quantitative results” (p. 38).

For the initial quantitative inquiry, a survey was used to ask the participants a number of questions about what they feel has had an impact on their decision-making processes when purchasing and implementing tools for their online program. This portion of the research provided a breadth of data from leaders representing many different types of institutions. However, the survey alone lacks some of the richness that the interviews provided, such as discussing why the participants answered in a certain way and capturing a more detailed sense of their experiences.

The qualitative study portion of the study is based on the methods of the phenomenological study as described by Creswell (2013). He explains this approach to a qualitative study as one that “describes the lived experiences of a concept or a phenomenon” (p. 76). Data collection typically consists of interviews with subjects who have experienced the phenomenon under examination and can number from “3 to 4 individuals to 10 to 15” (p. 78). It is then up to the researcher to “develop a composite description of the essence of the experience for all of the individuals” (p. 76).

Creswell (2014) suggests the creation of a diagram to clearly explain the approach being taken in the mixed methods study. He writes:

When our procedures are complex—such as in mixed methods, where there are multiple quantitative and qualitative data collection and analysis steps— it is helpful to have a visual diagram to pull together all of the components of the study. (p. 51)

The following is a diagram of the study (Figure 1). It places equal importance on both methods of data collection, but indicates how the quantitative phase has an impact on the qualitative phase.

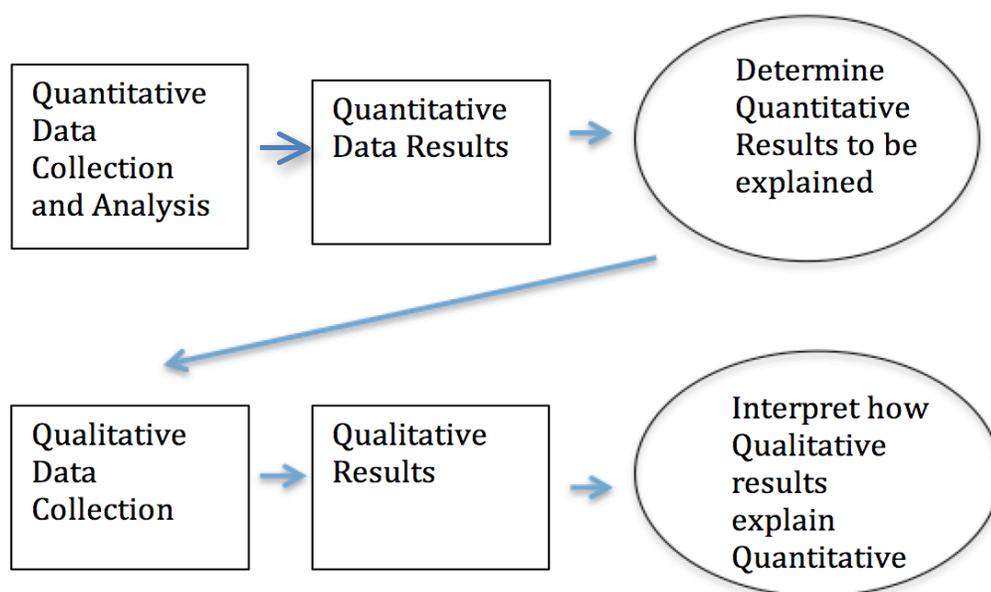


Figure 1. Mixed Methods Research Design (Quantitative to Qualitative)

After the study is conducted and data analyzed, the results are presented in the following sequence: first the results of the survey are shared, followed by a descriptive analysis of the interviews broken down by emergent themes and presented with representative quotes. Finally, a discussion follows that integrates and interprets the observations of the survey data with the qualitative findings.

Implementation of the Study

The following section describes how the survey for the study was developed, how the study's survey was created and tested, how the qualitative portion was carried out, and how the data were analyzed.

Study Sample

This study investigates the factors that have an impact on how tools are selected to support online learning programs in higher education institutions. Thus, the focus of this study is on the decision makers of online programs at higher education institutions. The study's sample was purposefully selected, which means certain characteristics were considered necessary to be a participant, including having a decision-making role for selecting and implementing online learning tools in a higher education institution. Since the study required such specificity, subjects were recruited via several methods described below.

Initially, 58 potential participants were identified and contacted via email and asked to participate in the survey (a total of 30 completed the survey). A variety of methods was used to identify participants, including attending professional conferences, requesting that participants recommend peers and contacts, and appealing to members of interest groups via the social media tool LinkedIn. Essential to the cultivation of the subject pool was snowballing, or network sampling, in which participants are asked to "nominate or recommend others who are known to have the profile, attributes, or characteristics desired" (MacMillan, 2008, p. 121). This method is considered highly effectual when working with a limited pool of initial participants.

It was through a national conference on the topic of online teaching and learning that initial contact was made with approximately a dozen participants. Through recommendations from this initial group, the number of participants was expanded. In addition, "cold call" emails were sent to potential participants based on profiles gleaned

from their institutions' websites. The subjects had professional titles that ranged from senior instructional designer to Provost within the division of their college responsible for online learning. Although the titles and responsibilities varied, all of the respondents had a primary role in making decisions regarding online tool selection. See Table 1 for more detailed participant information.

Table 1. Participant Demographics

<p><i>Participant details:</i></p> <ul style="list-style-type: none"> • Gender: 16 Male, 14 Female • Average Age: 49 years (Range from 35 to 70)
<p><i>Participants' titles:</i></p> <ul style="list-style-type: none"> • Vice-President: 6 • Provost: 1 • Dean: 1 • Associate or Vice Dean: 2 • Directors or Senior Directors: 15 • Other: 5
<p><i>Professional backgrounds:</i></p> <ul style="list-style-type: none"> • K-12 Educational Administration: 4 • Higher Education Administration: 28 • Teaching (Elementary and Secondary): 7 • Teaching (Post-Secondary): 23 • Corporate Training: 5 • Information Technology: 15 • Business: 2 • Public Relations/Marketing/Advertising: 0 • Development / Fund Raising: 0 • Military: 0 • Other: 1 (Non-Profit Informal Education)

Selecting Participants for the Qualitative Phase

The subject pool represented a diverse set of higher education institutions, including large and small, public and private, universities and colleges. The results also included an overview of professional backgrounds, experience with online teaching and learning, preferred teaching and learning preferences, satisfaction levels with the tools currently being used, among other data. Additionally, during the course of the survey, participants were asked if they were willing to be contacted for a follow-up interview.

After a preliminary analysis of the survey results, participants were identified for potential interviewing. In order to select which participants were to be interviewed, the data were viewed along two dimensions: professional backgrounds and tool satisfaction. Participants were segmented according to their background in teaching, information technology (IT), or both, and then further segmented based on their reported satisfaction with their current online learning environment and toolset.

The rationale for the participant's professional background being used as filter is related to Bates's (2005) observation that an important factor in tool choice includes longevity and supportability of the tools (which is a more IT point of view than an instructionally oriented one), as well as Jugovich and Reeves's (2006) description of the schisms between IT-driven and pedagogically driven perspectives related to training. Of the 30 respondents, 15 indicated having an IT background, while 23 reported a background in teaching. Of this group, 14 reported having backgrounds in both. At least one participant representing each background was chosen for an interview (two participants had backgrounds in both IT and teaching, two were IT only, and one had a background only in teaching).

The choice of *satisfaction* with tools as second dimension for grouping and selecting participants is based on the work of several researchers who have explored the impact of satisfaction on learners and instructors in online education.

A study by Sun, Tsai, Finger, Chen, and Yeh (2008) examined critical factors that influence learner satisfaction in e-learning. The research was based on a scale of six dimensions, including a student, instructor, course, technology, design, and environment, all of which could possibly impact student satisfaction with online learning tools. Their findings include that satisfaction of the learner is the most important factor in developing an online course, and that usability, quality, and flexibility of online tools are significant determinants.

A previous study by Chiu, Hsu, Sun, and Lin (2005) examined what influences the satisfaction with, and continued use of, e-learning tools. They found similarly that perceived usability, quality, and value are strong predictors of the intent to continue using a tool. Sobero and Sobero (2008) studied the level the satisfaction of online tools with university teachers in Norway. They looked at several factors that could influence the satisfaction with tools and concluded that their “results indicate that teachers’ perception of how useful an e-learning tool is, together with their confirmation of initial expectations, constitute the most important factors in explaining their satisfaction level” (p. 74).

Keengwe, Diteeyont, and Lawson-Body (2012) extended this research to include instructors and students in studying the satisfaction level with an LMS and online tools at a university. Their study grouped tools into four categories: content management, assessment or evaluation, student, and communication tools. They assessed both faculty and students’ satisfaction with the tools within each category. Their findings indicated that both students and instructors were satisfied with the tools, but with different aspects of them. However, a common theme was that positive feelings about the performance and quality of the tools and resources directly affected and increased satisfaction.

Notably in the work of Sobero and Sobero (2008), they state, “The results indicate that teachers’ perception of how useful an e-learning tool is, together with their confirmation of initial expectations, constitute the most important factors in explaining

their satisfaction level” (p. 74). Almost directly addressing those responsible for the creation of online environments, they continue, “The message to IS (*authors’ note: information systems*) practitioners are that they should not only focus on technical aspects (e.g. IT maintenance) in connection with e-learning tools, but also use resources [to] ensure and develop users’ motivation (cf. confirmed expectations and perceived usefulness) and competence” (p.74). The authors encourage allowing faculty participation in choosing the tools. Thus, it seems that *satisfaction*, which is born out of perceptions, expectations, and experience, is a critical factor in the development of not only online courses and learners’ tool use, but in the selection of tools themselves, and can be an useful way in which to approach the examination of the data.

In the end, eight potential subjects were identified and contacted via email, and a total of five subjects were interviewed based on their reported satisfaction with the tools, as well as their background experience in teaching and information technology. One-on-one interviews were then scheduled and conducted with four participants via Skype, and one was conducted in-person.

Quantitative Data Collection: Online Survey

The initial survey was developed to generate a broader understanding of how administrators in higher education were making decisions on selecting platforms and tools used in supporting online learning programs. To understand the context of the schools surveyed, a number of descriptive questions were asked, including the size of the program, number of courses being offered, number of instructors, types of online tools currently being used, and other demographic information. This information is important to the description of the institutions and allows for better comparisons between responses. Other questions in the survey were constructed based on the findings of the literature review and guided by the research questions framing this study.

The final survey tool was created in the online survey tool Qualtrics. Potential subjects received an email containing an invitation to the survey directly from the researcher, along with a link to follow to the survey. Responses were captured in the Qualtrics systems and subsequently analyzed for descriptive statistics using tools provided in the software itself, as well as through Microsoft Excel, by way of exporting the data to the compatible comma-separated value (csv) standard format. All survey responses were kept confidential by administering, as much as possible, an anonymous survey. Any identifying information was removed from the analyses and reporting.

Development of Survey Questions

The following is a thematic listing of the subtopics that were drawn from the literature review and used to inform the study's survey and interview questions:

- New paradigms for learning and the 21st century learner
- Social teaching and learning approaches
- Online teaching and learning frameworks and models
- Instructional design and learning technologies
- Faculty preparedness for online teaching
- Assessment techniques
- Online tools

Following this general outline, questions were grouped in this manner:

- *Personal Information*: collect information about the subjects to develop an understanding of their experience and approaches toward online learning and level of involvement with making decisions on the selection of online tools for teaching and learning.
- *Institutional Information*: collect information about the institution to help develop an understanding of how long and to what extent it has offered online learning and the scope and plans for its online program.

- *Tools and Technology*: collect information on the types of online tools and learning platforms the institutions are using, find out approximately how often they update tools and upgrade the infrastructure, and find out about how tools are selected at the institution.
- *Support and Training*: collect information on how tools are introduced to faculty and students, how faculty are trained to use the tools, and how faculty are trained to develop curriculum that takes advantage of tool strengths.

The questions used for the qualitative interview phase of the data collection built upon the information asked in the questionnaire, and some of the data collected in the survey helped in framing the questions being asked.

Survey Validation

Receiving constructive critical feedback is an important aspect of research design, as the value of the research is impacted by the validity of the tools used to conduct the research. To this end, the survey was reviewed by three experts in field: two professors of education knowledgeable about research methodology and education technology and one professional involved with developing and implementing policy studies for a government office. Additionally, the survey was pilot-tested with seven participants.

Survey Data Analysis

The survey was created and administered online via the survey tool Qualtrics, and the results were analyzed through a combination of the system's built-in reporting tools and Microsoft Excel.

In order to analyze the data, the survey responses (n=30) were split into two comparable sub-groups, subjects who reported that they were satisfied (n=18) with their current tool set, and subjects who reported that they were not (n=12). *Satisfaction* with tools was chosen as an indicator that takes into account experience, expectations, and use of the technology in question. The work of several researchers (Chiu et al., 2005;

Keengwe et al., 2012; Sun et al., 2008; Sorebo & Sorebo, 2008) points to this factor as being important in determining the success of online tool and platform use, and provides an initial way to start looking at and evaluating the data. Though many approaches could be used, since the focus of the study is on selection of tools, overall satisfaction seems to be an indicator that takes into consideration several other variables that were asked in the survey.

Qualitative Data Collection: In-person Interviews

To gain insight beyond the survey data about the experience of online tool selection, more detailed information was collected via personal interviews. As mentioned earlier, purposeful sampling was used to select participants who could best address specific questions central to the research, and after potential interviewees were identified, email solicitations were sent out and one-on-one interviews scheduled.

The interviews were conducted using semi-structured and open-ended questions (McMillan, 2008) to ask the interviewees to discuss topics that addressed tools, teaching methods, and course development. The interviews provided an opportunity to elicit personal insights into the factors that drive the decisions behind online tool selection. Personal and idiosyncratic dimensions, challenges, and successes in the different institutional settings provided a more complete picture of how and why certain tools are selected.

The audio-only interviews were primarily conducted over the Internet via Skype, using the Skype add-on application “Call Recorder” to record the conversation. One interview was conducted in person, with the conversation being recorded via the researcher’s iPhone. All data were collected after a review of the study was conducted following protocols shared with the Teachers College, Columbia University Institutional Research Board, which granted permission to conduct the study. Interviewees were informed before the interview began that the conversation would be recorded, and that all

identifying information would be removed from the analysis and report. The subsequent media files were stored on the researcher's laptop and accessed only by the researcher for transcription purposes.

The recordings of the interviews were transcribed by the researcher, with assistance from the "Express Scribe" transcription assistance software, which allows the audio file to be slowed down and sped up. After the researcher transcribed the interviews, the transcriptions were sent back to the interviewees for review, an important step in validating the data that had been collected (Creswell, 2013).

Interview Data Analysis

The approach used for analyzing the interview materials is based on Creswell's description of the phenomenological approach to qualitative research, which is in turn based on the work of the psychologist Carl Moustakas. This particular approach to the phenomenological studies follows data collection with an analysis that systematically moves from "the narrow units of analysis (e.g. meaning units), and on to detailed descriptions that summarize two elements, 'what' the individuals have experienced and 'how' they have experienced it" (Moustakas, 1994, in Creswell, 2013, p. 79).

Additionally, the use of "bracketing" (or "the epoche"), in which the researcher's experience in the topic is explicitly stated, is performed before and during the analysis. This process is one "in which investigators set aside their experiences, as much as possible, to take a fresh perspective toward the phenomena under examination." (p. 80). Bracketing is thus used as a way to allow the researcher to step back from the phenomena and provide a lens for the reader to understand the researcher's relationship to the topic.

The qualitative data was analyzed using an *inductive* approach. Gill, Stewart, Treasure, and Chadwick (2008) describe this common method of analysis as a method that "involves analysing data with little or no predetermined theory, structure, or framework, and uses the actual data itself to derive the structure of analysis" (p. 429).

The approach is often broken down into steps that begin with “identifying themes and categories that ‘emerge from the data.’ This involves discovering themes in the interview transcripts and attempting to verify, confirm and qualify them by searching through the data and repeating the process to identify further themes and categories” (p. 420).

Creswell (2013) also supports this approach, stating that the first step in analyzing the interview data is a careful reading of all interviews in which all “significant statements” that emerged from each interview are collected, which then leads to “clusters of meaning” (p. 82). These statements are then used to write a “textual description” of what participants experienced and a “structural description” of the context in which they experienced it (p. 82). The final step is to provide an aggregated description of the essence of the experience, called the “essential, invariant structure” (p. 82), which is intended to expose the underlying structure of the phenomena.

Analysis of qualitative data can be done “by hand” by the researcher, or by utilizing applications that help with analyzing the data by organizing content and coding. However, as Gill et al. (2008) warn,

Whilst computer programmes can facilitate data analysis, making the process easier and, arguably, more flexible, accurate and comprehensive, they do not confirm or deny the scientific value or quality of qualitative research, as they are merely instruments, as good or as bad as the researcher using them. (p. 430)

The researcher used the online application “Dedoose” for assistance with organizing and coding the study’s qualitative data. The tool, which is designed for the mixed methods researcher, allows for both quantitative and qualitative data to be entered, linked, and coded (by the researcher), and ultimately analyzed. In this study, the interview transcriptions were stripped of identifying information, loaded in the cloud-based system, and used to help facilitate the coding of the data.

Qualitative Data Validation

For qualitative data validation purposes, a member check (Creswell, 2013) was used at a particular point in the study by providing transcriptions of the interviews to the subjects prior to their analysis for any comments and clarifications. Two of the five interviewees provided minor corrections to their interview transcripts.

After coding, the qualitative analysis was shared with a full-time professor at a leading higher education institution with a background in educational technology to provide an independent review of the codes that were created and applied to the interviews. Creswell (2013) describes conducting an external audit of the coding as being a mechanism to provide inter-rater reliability to the study.

Additionally, the data provided by the two phases of the mixed methods approach allow for checking between data sources: the survey provides basic data with which to validate the interviewees' statements (Creswell, 2013).

Protection of Human Subjects

Prior to the research being conducted, the researcher received approval from the Teachers College, Columbia University Institutional Research Board. The application for the study was submitted in the summer of 2014 and was granted exemption status. The protocol number granted by the Teachers College, Columbia University IRB in August 2014 is 14-373. The informed consent form, along with the text of the email soliciting participants, and the approved outline of questions asked during the interview phase are attached in the Appendices.

Chapter IV

RESULTS

Quantitative Data Results

The following section is a report of the results of the online survey portion of the study, which was completed by 30 participants. The survey was distributed during the fall of 2015 via an email containing an invitation to follow a link to an anonymous survey set up and hosted on the Qualtrics system. A printout of the survey can be seen in Appendix A.

Description of the Participants

As described in the previous chapter, the sample was created by contacting higher education professionals in decision-making positions in online learning at their respective higher education institutions. The final pool of participants was a mixture of undergraduate, graduate, private, and public colleges—including two that offer their degrees almost exclusively online. Table 2 provides a detailed overview of the survey participants.

Table 2. Participant and Institution Demographics

<i>Participant demographics:</i>
<ul style="list-style-type: none"> • Gender: 16 Male, 14 Female • Average Age: 49 years (Range from 35 to 70)
<i>Participants' titles:</i>
<ul style="list-style-type: none"> • Vice-President: 6 • Provost: 1 • Dean: 1 • Associate or Vice Dean: 2 • Directors or Senior Directors: 15 • Other: 5
<i>Participant's professional background:</i>
<ul style="list-style-type: none"> • K-12 Educational Administration: 4 • Higher Education Administration: 29 • Teaching (Elementary and Secondary): 7 • Teaching (Post-Secondary): 23 • Corporate Training: 5 • Information Technology: 15 • Business: 2 • Public Relations/Marketing/Advertising: 0 • Development / Fund Raising: 0 • Military: 0 • Other: 1 (Non-Profit Informal Education)
<i>Institutional demographics:</i>
<ul style="list-style-type: none"> • Institution size:* <ul style="list-style-type: none"> ○ Very Small (< 1000 students): 1 ○ Small (1000 to 2,999 students): 4 ○ Medium (3,000 to 9,999 students): 12 ○ Large (>= 10,000 students): 13
<ul style="list-style-type: none"> • Institution Type: <ul style="list-style-type: none"> ○ Public: 14 ○ Private: 16 ○ Community College: 1 ○ Technical School / University Extension: 2 ○ Graduate and Undergraduate: 16 ○ Undergraduate Only: 3 ○ Graduate Only: 8

Table 2 (continued)

<i>Institutional demographics (continued):</i>
<ul style="list-style-type: none"> • Institutional Setting: <ul style="list-style-type: none"> ○ Rural: 3 ○ Suburban: 4 ○ Urban: 16 ○ Multiple Campus / Mixed Settings: 6 ○ Online: 1
<ul style="list-style-type: none"> • Region:** <ul style="list-style-type: none"> ○ Northeast: 15 ○ Midwest: 4 ○ South: 6 ○ West: 5

*Size as defined by the Carnegie Classifications of Institutions of Higher Education (2016)

** Regional divisions of the United States according to US Census Bureau (2016)

As noted in the Methods chapter, the researcher identified and contacted 58 potential participants, and a total of 30 completed the survey. A variety of methods were used to find potential participants, but the key characteristics for all subjects were similar. All participants were professionals involved with the selection and implementation of the learning tools at their institutions. The participants' professional titles ranged from *Senior Instructional Designer* to *Provost* within the division of their college responsible for online learning. Two participants reported positions similar to senior instructional designer, and one, a faculty member with previous administrative experience.

Of the colleges represented by the survey participants, 16 were private non-profit institutions, and 14 were public institutions. All the schools were located in the United States, 5 located in the Northeast, 2 in the Midwest, 4 in the South, and 3 in the West. Most of the schools are a mix of undergraduate and graduate colleges and universities, 2 schools are community colleges, and 1 a technical school. Sixteen of the schools reported to be in urban locations, 4 suburban, 3 rural, and 6 have multiple campuses in both urban and suburban settings. One is entirely online. Nineteen of the schools offer

undergraduate degrees, 23 graduate degrees, and 3 offer professional development and continuing education.

Of the participants, 15 are Directors or Senior Directors of their divisions, 2 are Associate or Vice Dean, 1 Provost, 1 Dean, 1 Provost, 6 Vice-Presidents, and 5 reported “other.” The “others” consist of learning architects with a significant role in the selection of tools at their institutions. In the sample, 16 were male, and 14 female, with an age range between 35 and 70.

Participants’ Professional Backgrounds

At the outset of the survey, participants were asked to select categories that best represented their professional backgrounds. Presented as a multiple selection, the choices and the corresponding number of people who indicated each are shown in Table 2.

One approach to the data analysis was based on grouping participants by whether they had a background in Information Technology, and/or a teaching background. Fifteen of the participants had an IT background, and 22 reported a teaching background. While there was a great deal of overlap in terms of participants with both elements in their background, there were 3 respondents who had reported no background in teaching and 15 with no background in Information Technology. Almost all reported higher education administration experience.

Impact of Professional Background

The participant’s background was analyzed to see whether or not there were any indications of a relationship with the pedagogical and technical factors raised in the survey. While experts in information technology and in teaching work hand-in-hand to create and support a working online learning environment, these professions can also foster different perspectives on tools and learning environments. This was a theme that was reinforced in the some of the interviews, and was discussed by Jugovich and Reeves

(2006) as they explored the schism between IT and faculty needs in a professional development situation:

Traditionally, IT departments have not required pedagogical expertise when hiring staff because the majority of IT jobs do not require this background. As a consequence, when IT staff added technology training to their duties, the focus was on the mechanical use of the tool. For many years this was acceptable, but as educational technology became more commonplace and its use more wide-spread (including laptop initiatives and online education, for example), training sessions naturally turned to the pedagogical use of the technology. (p. 58)

While there were only 3 respondents without a teaching background, the data suggest that having experience in both IT and teaching, or exclusively in either one, may have some bearing on the weight given to the various factors in selecting tools.

Role in Tool Selection and Implementation

Survey participants were asked about the roles they play in the selection and implementation of tools; this is shown in detail in Figure 2. The survey options were *research, evaluate, recommend, purchase, implement, train, provide technical support, provide instructional design, and other*. Overall, the participants were extremely involved with the tool selection and implementation. The majority (90%, n=27) indicated that they *recommend* the tools to purchase, 80% (n=24) said they *evaluate*, and 76% (n=23) *research* the tools. Seventy percent (n=21) also indicated that they *implement* the tools, and 63% (n=19) indicated that they directly *train* and *provide instructional design*. The percentages are lower for actual *purchasing* with 40% (n=12), and 50% (n=15) providing *technical support*.

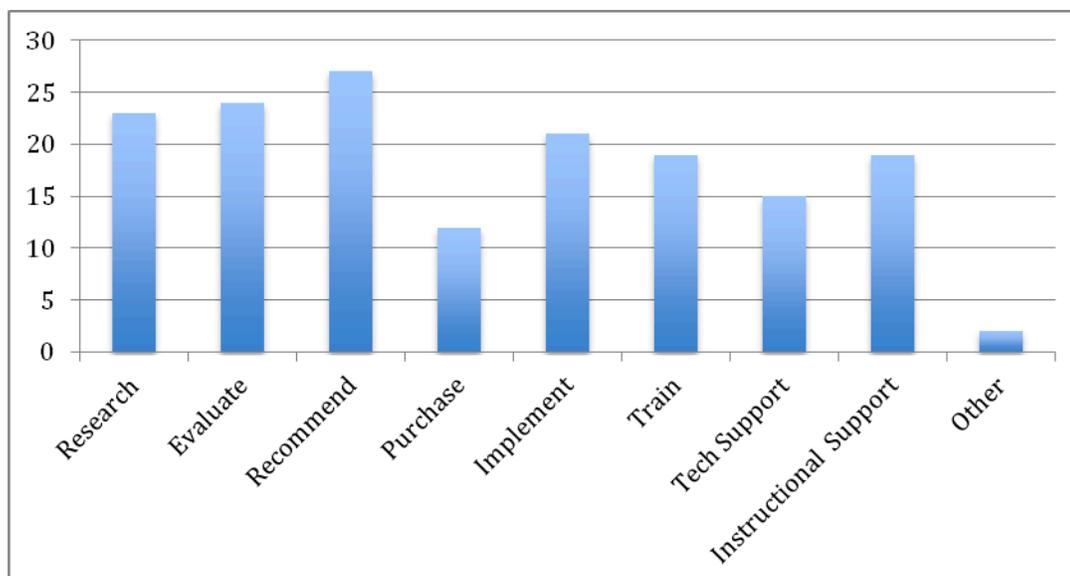


Figure 2. Participant's Role in Tool Selection

Satisfaction with Tools

Participants were asked if they were either *satisfied* or *dissatisfied* with the online tools and platforms that their institutions currently offered. The survey question specifically asked: "Considering your teaching and learning preferences, do the systems and tools that you currently offer, support your institution's online learning environment to your satisfaction?"

The split between participants who indicated that they were *satisfied* with the tools was 60% (n=18) indicating "yes" to 40% (n=12) indicating "no." Of the participants who indicated they were *satisfied*, the majority (16) had a role in *recommending* tools, and a smaller number (5) were involved with *implementing*.

Of the 18 who stated that they were *satisfied* with the tools, 11 reported to have taught online, and 7 had not. Of the 11 who had taught online, they reported between 2 and as many as 30 semesters of online teaching experience.

Of the 12 who indicated *dissatisfaction*, the majority (11) had a role in *recommending* tools, and almost all (10) *implemented* the tools. From this set, 11

indicated that they had taught online and 1 had not. For those who had taught online, the number of semesters of teaching online ranged from 2 to 40.

One observation is that there is little difference in the percentages of participants who were *satisfied* with the tools and were involved with *recommending* their selection (89%, n=16 of 18) and the number of people who were *dissatisfied* with the tools and *recommended* their selection (92%, n=11 of 12). However, there is a noticeable difference in the number of participants who were *satisfied* with the tools and who also *implemented* them (60%, n=11 of 18), compared to those *dissatisfied* and have *implemented* (83%, n=10 of 12). In other words, there was a higher level of participants reporting being *dissatisfied* with the tools when they participated in the implementation process.

Satisfaction level with current tool set. The follow-up question in the survey asked, “How satisfied are you with the online learning tools currently being used at your institution?” In this question, the wording about personal learning preference was taken out of the question, and the answer choices were expanded to a 5-point scale ranging from *Very Satisfied* to *Very Dissatisfied*.

Figure 3 shows the responses across all 30 participants, and from the 18 people who reported that they were *satisfied* in the previous questions, 3 reported *very satisfied*, 14 reported to be *satisfied*, and 1 reported *neutral*. Of the 12 who indicated that they were dissatisfied in the previous question, 2 reported to be *satisfied*, 4 *neutral*, 4 *dissatisfied* and 2 *very dissatisfied*.

Of note is that 2 people who reported to be *dissatisfied* in the first question indicated *satisfied* in the next question when personal preference to learning styles was removed. This may indicate that personal learning preference was less important in their overall view of satisfaction with the tools, or possibly that the question was misunderstood.

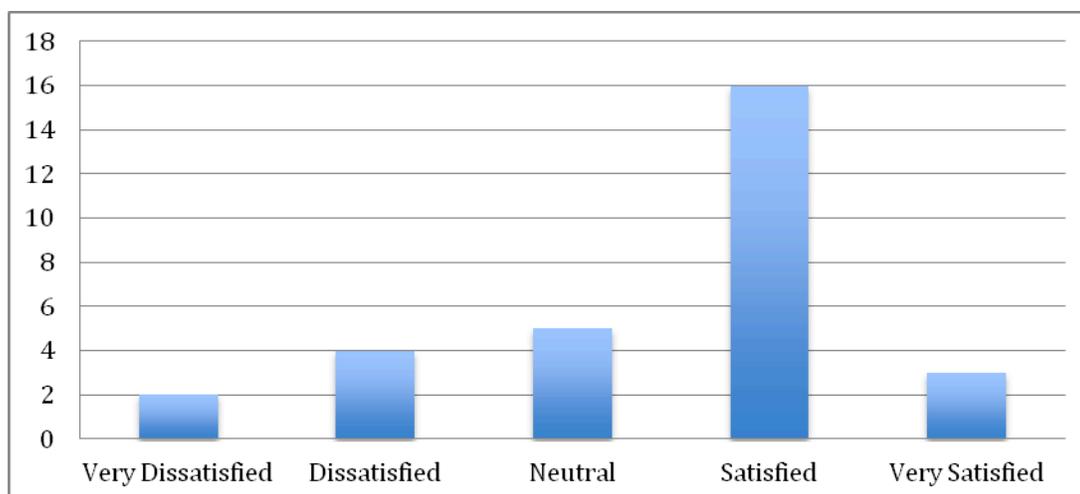


Figure 3. Levels of Tool Satisfaction across All Participants

Online Teaching and Learning Experience

Across all participants, 73% (n=22) of respondents had taught at least one online course, while 27% (n=8) reported that they had not taught online at all. In the group that had taught online, the *satisfaction* level with the tools was evenly split. Of the subjects who reported that they had not taught an online course, only 1 reported to be *dissatisfied* with the tools (Table 3).

Table 3. Experience Teaching Online Course and Satisfaction with Tools

		Have you taught an online course?		
		Yes	No	Total
Considering your teaching and learning preferences are you satisfied with online tools?	Yes	11	7	18
	No	11	1	12
Total		22	8	30

When analyzed against the level of satisfaction, the subjects who had not taught online indicated mostly being satisfied (75%, n=6) and neutral (25%, n=2), while the subjects with teaching experience indicated more variation (see Table 4).

Table 4. Experience Teaching Online Course and Satisfaction with Tools

		Have you taught an online course?		
		Yes	No	Total
How satisfied are you with the online learning tools?	Very Dissatisfied	2	0	2
	Dissatisfied	4	0	4
	Neutral	3	2	5
	Satisfied	10	6	16
	Very Satisfied	3	0	3
Total		22	8	30

Satisfaction with tools and experience taking online courses. Similarly, in response to whether the participants had taken an online course, 87% (n=26) reported having taken an online class, while 13% (n=4) reported that they had not. Of those who had experienced taking at least one online course as a student, 15 were *satisfied* with the tools they currently used, and 11 were not. Of those who had not taken online courses, 3 reported being *satisfied* with the tools, while 1 was *dissatisfied* with their current tools (see Table 5).

Table 5. Degree of Satisfaction with Tools with Participation in an Online Course

		Participated in an online course as a student?		
		Yes	No	Total
Considering your teaching and learning preferences are you satisfied with online tools?	Yes	15	3	18
	No	11	1	12
Total		26	4	30

When asked the degree of satisfaction, of the 4 who reported not having participated in an online course, the level of satisfaction was evenly split between neutral and satisfied, and of the 26 of respondents who had taken an online course, 77% (n=20) reported neutral to very satisfied with the tool (see Table 6).

Table 6. Degree of Satisfaction with Tools and Participation in an Online Course

		Participated in an online course as a student?		
		Yes	No	Total
How satisfied are you with the online learning tools?	Very Dissatisfied	2	0	2
	Dissatisfied	4	0	4
	Neutral	3	2	5
	Satisfied	14	2	16
	Very Satisfied	3	0	3
Total		26	4	30

Satisfaction with tools and experience developing online courses. In terms of experience developing online courses, the split was the same as those taking courses: 87% (n=26) reported developing online classes, while 13% (n=4) reported that they had not developed an online course. Of those who had developed at least one online course, 15 indicated that they were *satisfied* with their current toolset, and 11 were *dissatisfied*. Of the 4 who had not developed courses, 3 reported being *satisfied* with the tools, and 1 reported being *dissatisfied* with the tools (see Table 7).

Table 7. Development of Online Courses and Satisfaction with Tools

		Developed an online course?		
		Yes	No	Total
Considering your teaching and learning preferences are you satisfied with online tools?	Yes	15	3	18
	No	11	1	12
Total		26	4	30

Looking further into the satisfaction levels, of those who had developed an online course (n=26), 6 were either *dissatisfied* or *very dissatisfied* with the tools, while 4 were neutral, and the rest (n=16) either *satisfied* or *very satisfied* with the tools. Of the

participants who reported not having developed a course (n=4), 1 reported feeling *neutral* and 3 *satisfied* (see Table 8).

Table 8. Development of Online Courses and Satisfaction Levels with Tools

		Developed an online course?		
		Yes	No	Total
How satisfied are you with the online learning tools ...	Very Dissatisfied	2	0	2
	Dissatisfied	4	0	4
	Neutral	4	1	5
	Satisfied	13	3	16
	Very Satisfied	3	0	3
Total		26	4	30

Preferred Approaches to Teaching and Learning

Participants were asked to rank their preferred learning approaches from *very effective* to *not effective* (5-point scale, 1 point being *unknown*). The term *effective*, as applied to the various question of tools and teaching approaches, is similar to the definition proposed by Bradford Bell and Jessica Federman in their 2013 meta-analysis of e-learning in post-secondary education. Bell and Federman wrote that the term is often applied in e-learning studies as comparisons between in-person and online. However, the researchers suggest a more expansive definition of effectiveness and instead take a cue from Richard Clark's (1994) agnostic point of view that technology is a tool to be employed by instructional designers and its pedagogical use is paramount in its proper use. Bell and Federman also cite the work of Steven Ross, Gary Morrison, and Deborah Lowther (2010) in their definition of education technology "as a broad variety of modalities, tools and strategies for learning. Its effectiveness, therefore, depends on how well it helps teachers and students achieve the desired instructional goals" (p. 19). Thus,

the term *effectiveness*, in this study, is seen as the degree to which the tool or learning approach in question meets the participant's pedagogical goals.

The teaching and learning approach choices were *case-based*, *client-based*, *discussion-based*, *problem-based*, *project-based*, *self-paced*, *lecture based*, and *other*. Among all of the respondents, it was generally reported that *lecture-based* learning was the least effective approach to online learning, with all 30 indicated that it was either *not effective* or only *somewhat effective* (total: 70%, n=21), and all believed that *problem-based* (87%, n=26), *project-based* (87%, n=26), and *case-based* learning (90%, n=27) were either *very effective* or *moderately effective*. *Discussion-based* learning was considered *very effective* by 53% (n=16) or *moderately effective* by 33% (n=10) (see Figure 4).

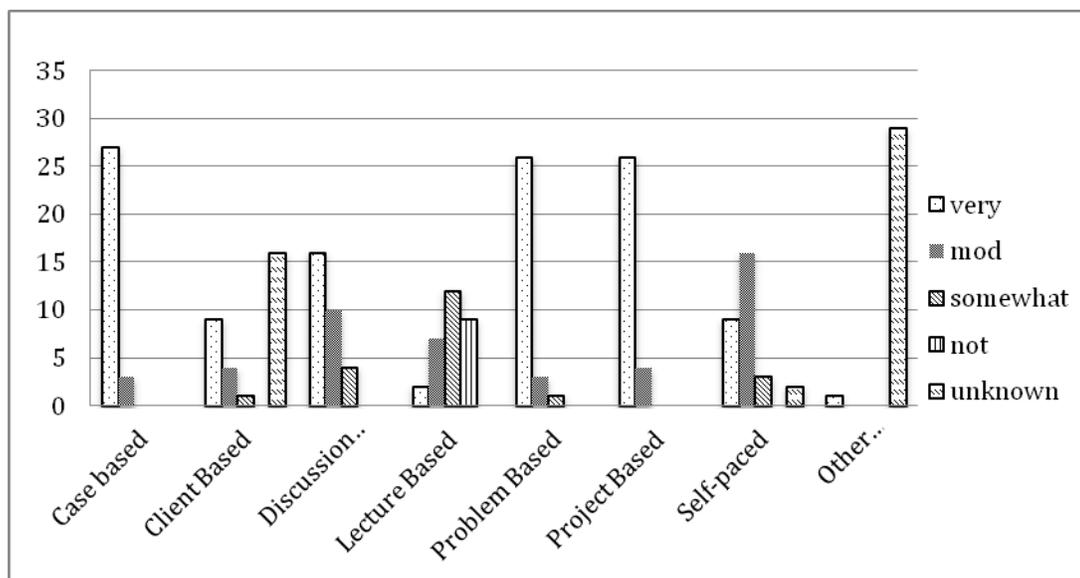


Figure 4. Preferred Approaches to Teaching and Learning among All Participants

Preferred approaches to teaching and learning, among *satisfied* participants.

Further filtering the data on *satisfaction* with tools (n=18), the teaching and learning preferences were similar to the total participants' numbers. Sixteen indicated that *case based* and *project based* learning was *very effective*, while 1 indicated that *problem based*

learning was only somewhat effective, and 14 indicated that *discussion based* learning was very effective. *Problem- and project based* learning was also preferred, with 15 indicating *very effective*; *project-based* has 14 indicate it as *very effective* (see Figure 5).

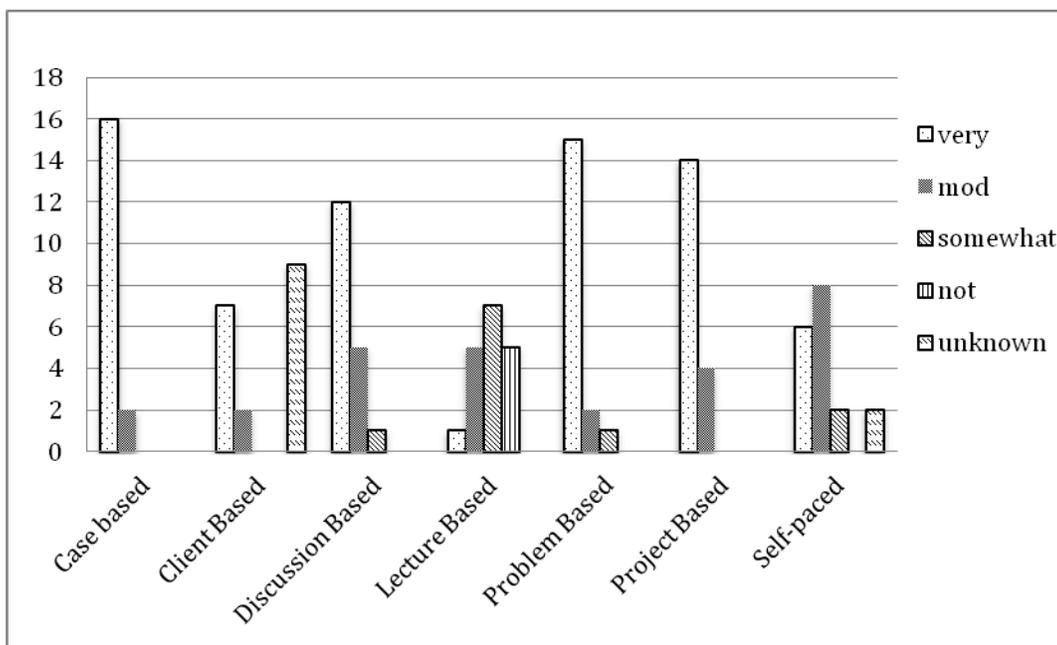


Figure 5. Preferred Approaches to Teaching and Learning, *satisfied* participants

Preferred approaches to teaching and learning, among *dissatisfied*

participants. For those who were *dissatisfied* with their current toolset (n=12), overall the preferences were similar to those *satisfied*; however, in the reported effectiveness of *discussion-based* learning, only 5 rated *discussion-based* learning as being *very effective*. The ratings for this approach were split somewhat more evenly between *very effective* (n=4) and *moderately effective* (n=5), with several more participants indicating it only being *somewhat effective* (n=3). *Project-based* and *problem-based* were also rated higher, with 11 and 12 indicating *very effective*, respectively. *Self-paced instruction*, proportionate to sample size, had more reports of *moderate effectiveness* (n=8 of 12, 66%) compared to the people reporting satisfaction with their toolset (n=8 of 18, 44%) (see Figure 6).

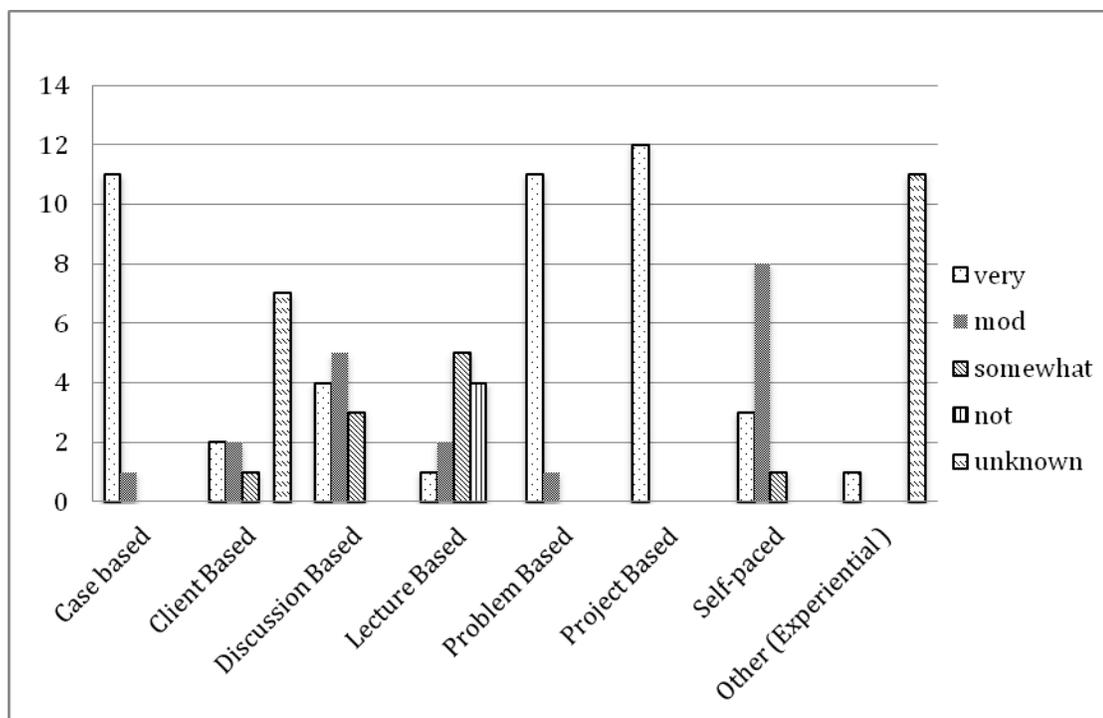


Figure 6. Preferred Approaches to Teaching and Learning, *Dissatisfied* Participants

Preferred approaches for in-person teaching and learning. In the results for preferred in-person teaching and learning approaches, 27 participants indicated *somewhat* and *moderately* effective to the *lecture* approach, and none indicated *highly effective*. For *discussion-based*, 16 indicated *very effective*, while 10 indicated *moderately effective* and 4 *somewhat effective*.

For other social learning approaches, the ratings of effectiveness were as follows: for *problem-based* learning, 22 reported very effective (as opposed to 26 for online), and for *project-based*, 23 reported very effective (as opposed to 26 for online). Finally, *case-based* said about the same (27 said *very effective* online, 26 said *very effective* in person). This would seem to suggest that between in-person and online teaching and learning, there is not a dramatic shift in the favored approaches, though there is a small shift in the perception that approaches like problem-based and case-based are slightly more effective online.

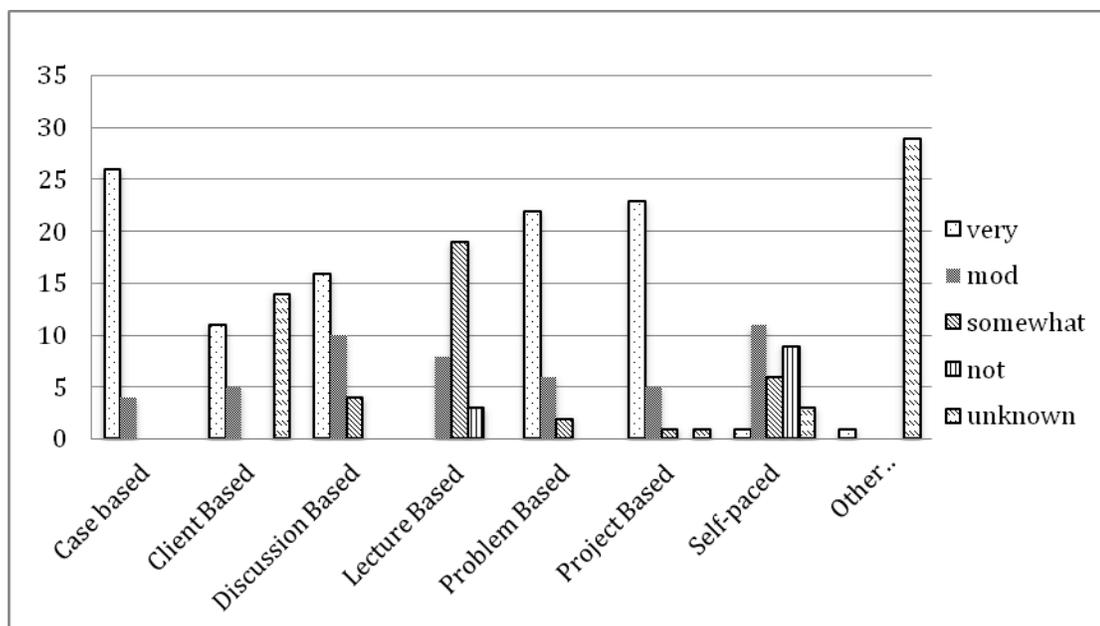


Figure 7. Preferred In-person Teaching Approaches, All Participants

Preferred teaching and learning approaches with online teaching experience.

When reviewing which learning approach was considered most effective, but only looking at subjects who have online teaching experience (n=22), preference for project-based topped the list with 95% (n=21) respondents indicating that it is *very effective*. This was followed by problem-based and case-based, both at 91% (n=20). Discussion-based came in at 63% (n=14) saying it is *very effective* (see Figure 8).

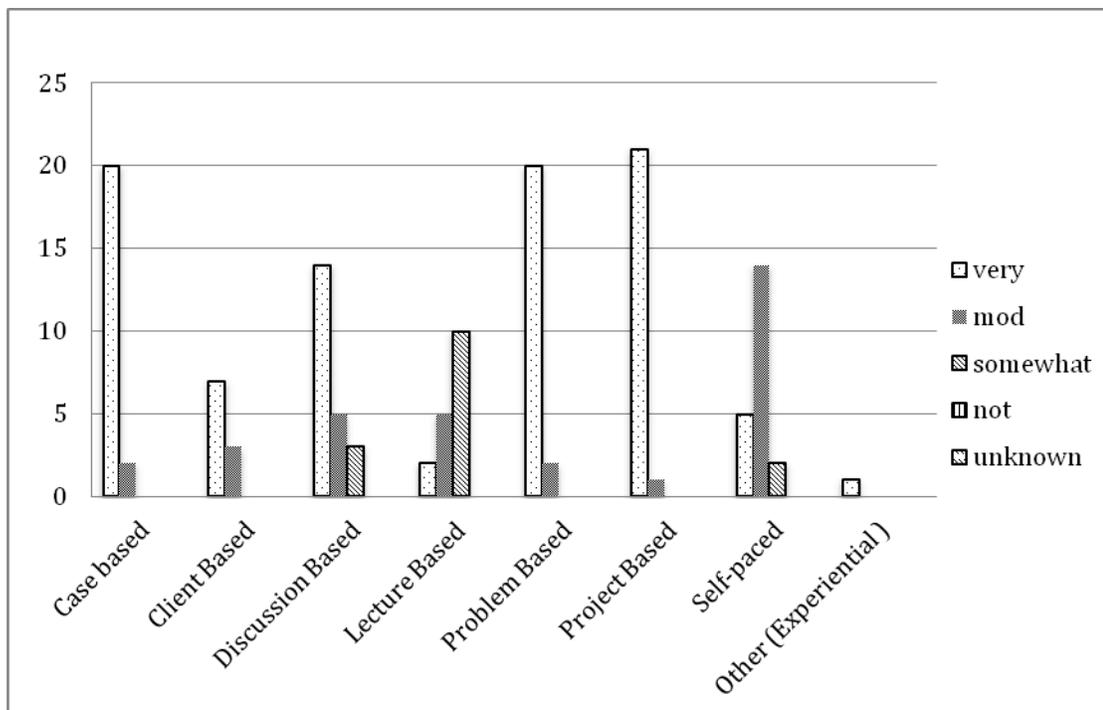


Figure 8. Teaching and Learning Approach Choices among Participants with Online Teaching Experience

Preferred teaching and learning approaches without online teaching

experience. When looking at the preferred teaching and learning approaches for subjects who had *not* taught online ($n=8$), the number of participants who claimed *very effective* for *case-based* learning approaches was 88% ($n=7$) and *problem-based* 75% ($n=6$). These findings are similar to the preferences expressed by participants who had taught online. However, a slight shift was noticeable within *discussion-based*, where the number of participants who indicated that it is moderately effective was greater, and within *project-based*, where there was greater agreement on its effectiveness (see Figure 9).

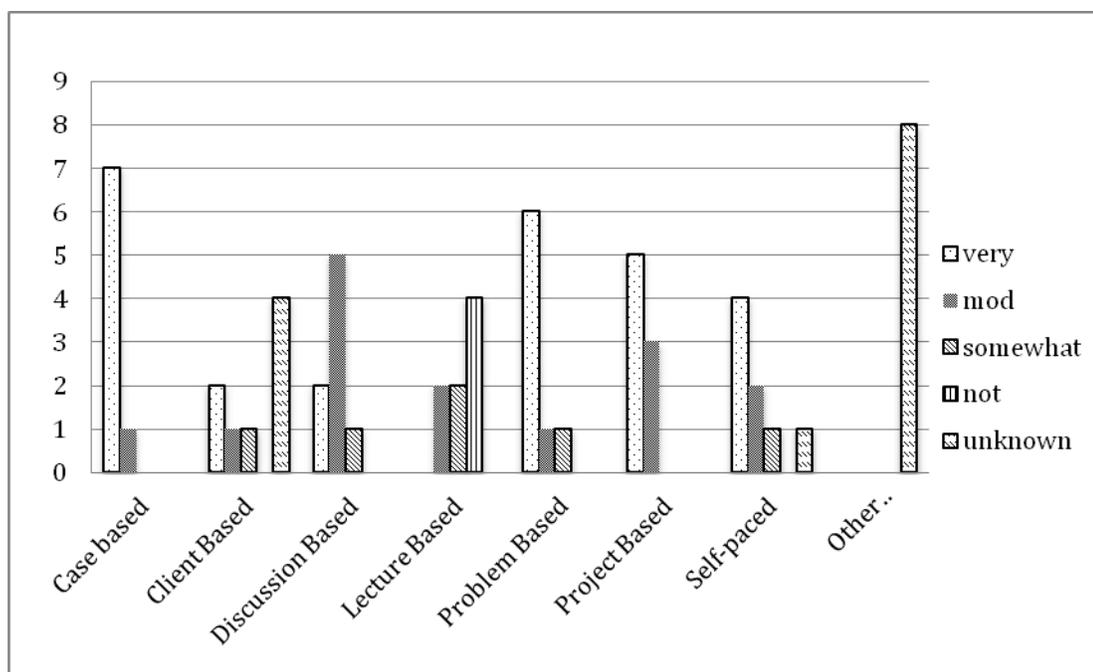


Figure 9. Teaching and Learning Approach Choices among Participants without Online Teaching Experience

Preferred teaching and learning approaches experience taking an online course. Filtering by the effectiveness of online teaching and learning approaches by the participants who have taken online courses (87%, n=26), *case-based*, *problem-based*, and *project-based* still stayed in to the top percentile. There was also an increase in the favorability ranking of *discussion-based* and, to a very small degree, *lecture-based* approaches (see Figure 10).

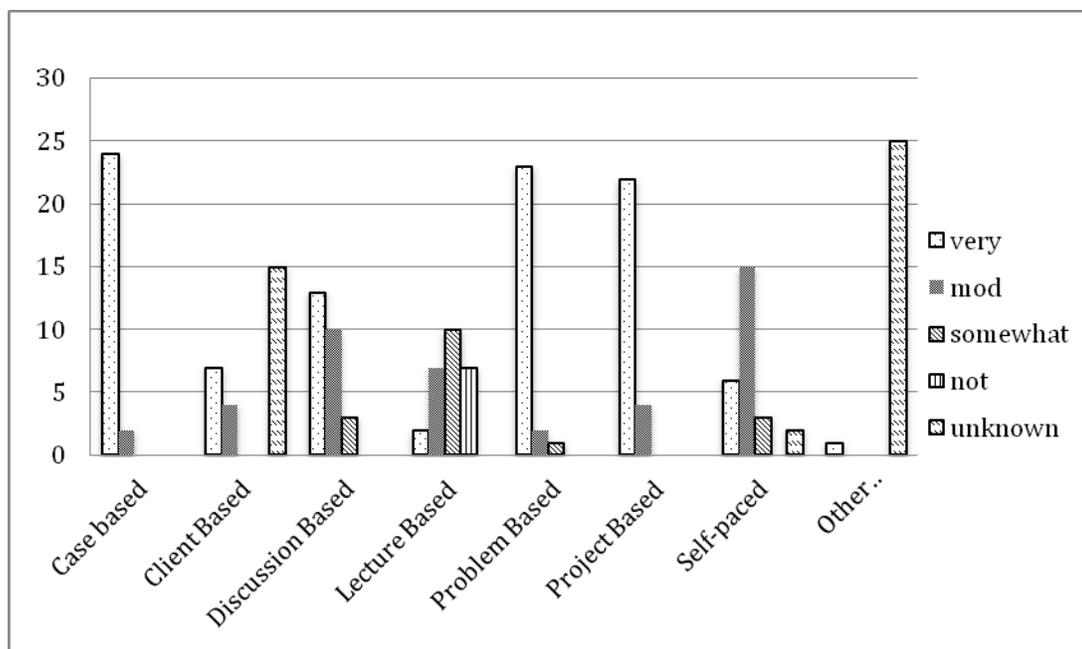


Figure 10. Teaching and Learning Approach Choices among Participants Having Taken an Online Course

The remaining 13% of the participants (n=4) reported having not taken an online class. The difference we see in this small subgroup is that most of the preferred approaches skew noticeably toward one of the degrees; for example, *case-based*, *client-based*, *problem-based*, and *project based* were all rated as *very effective*, and 3 indicated discussion as *very effective* (see Figure 11).

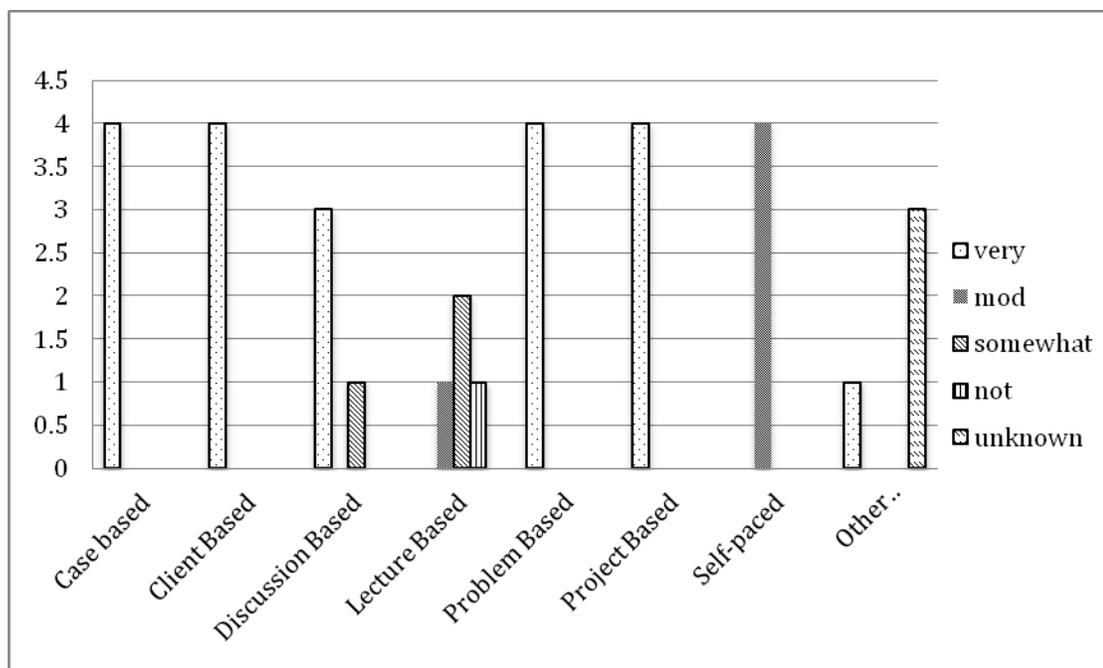


Figure 11. Teaching and Learning Approach Choices among Participants without Online Student Experience

Satisfaction with tools for participants with online teaching and learning

experience. Finally, filtering the results through the lens of *satisfaction* with tools and with online teaching experience (n=11), *discussion-based learning* was very high (100%, n=11), while *project-based* was only slightly less (91%, n=10) and on par with *problem-based* (91%, n=10). *Lecture-based* had 1 report of being *very effective*, but the results cluster toward the negative end of the scale (see Figure 12).

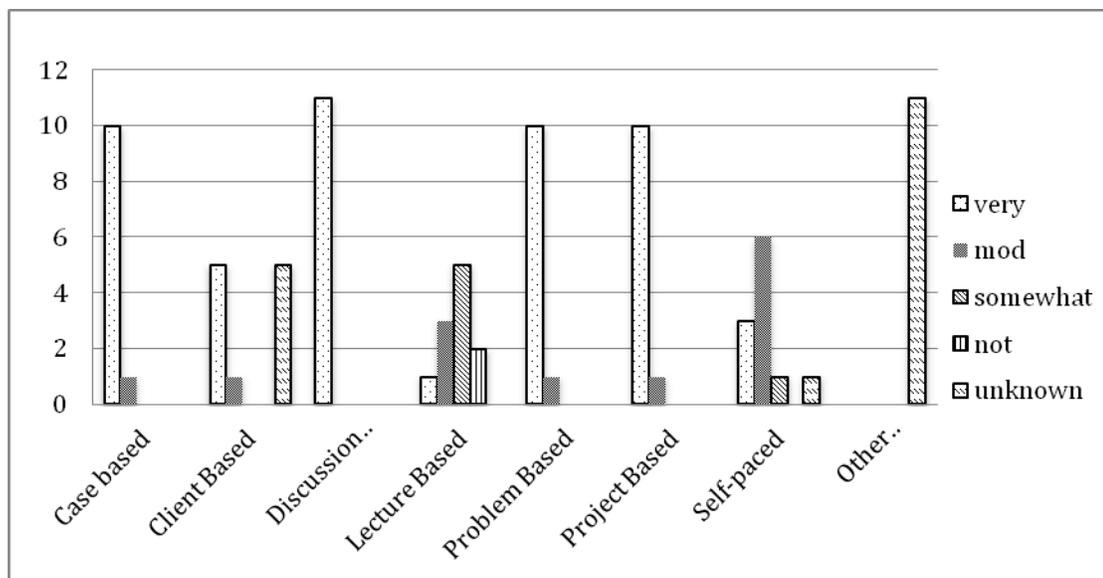


Figure 12. Teaching and Learning Approach Choices among Participants Satisfied with Tools and Who Have Online Teaching Experience

Satisfaction with tools for participants without online teaching and learning experience. For those *dissatisfied* with the tools ($n=7$), the experience seems to impact the results a bit differently. For *discussion-based*, only 1 participant indicated that it is *very effective*, and the majority ($n=5$) indicated it as moderately effective. *Case-based* fared best with 86% ($n=6$) indicating it is very effective. The favorable perception of *problem-based* dipped a bit from the group with experience to 71% ($n=5$) indicating it is *very effective*, and *project-based* dropped even further. *Lecture-based* fared poorly, too, with the majority indicating it is not effective (see Figure 13).

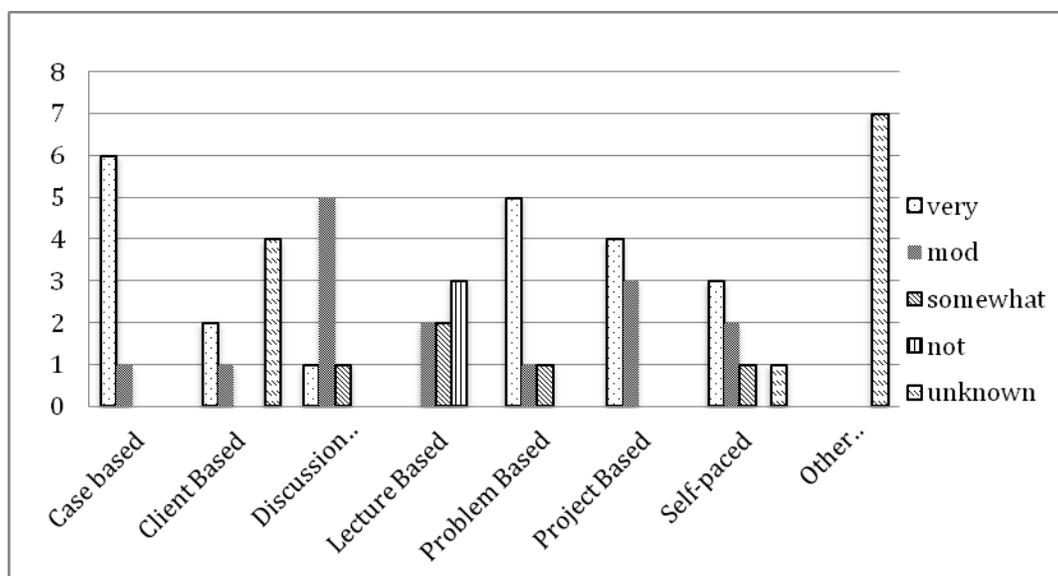


Figure 13. Teaching and Learning Approach Choices among Participants Dissatisfied with Tools and Who Have Online Teaching Experience

Examining the Toolsets

In this section of the survey, participants were asked for their input on the types of tools they thought were effective for online teaching and learning, what tools they currently used, and what factors influenced their decisions on whether to use them. The data are first viewed as a whole, and then broken down between the participants indicating *satisfaction* or *dissatisfaction* with the tools.

What tools are people using? To gain a basic understanding of the tools being used, the survey first asked for participants to list the tools that came to mind in an open text field, and next presented a listing of possible tools to select from. The results of which tools participants selected follow (see Figure 14), then a listing of other tools mentioned (see Table 9).

A review of the data shows that Google Apps is the most ubiquitous toolset; however, this is not surprising given that it is free for colleges and offers deep integration between file collaboration and the colleges' email and chat communication systems. In LMS, Blackboard products hold a slight edge over Canvass, Sakai, and Moodle.

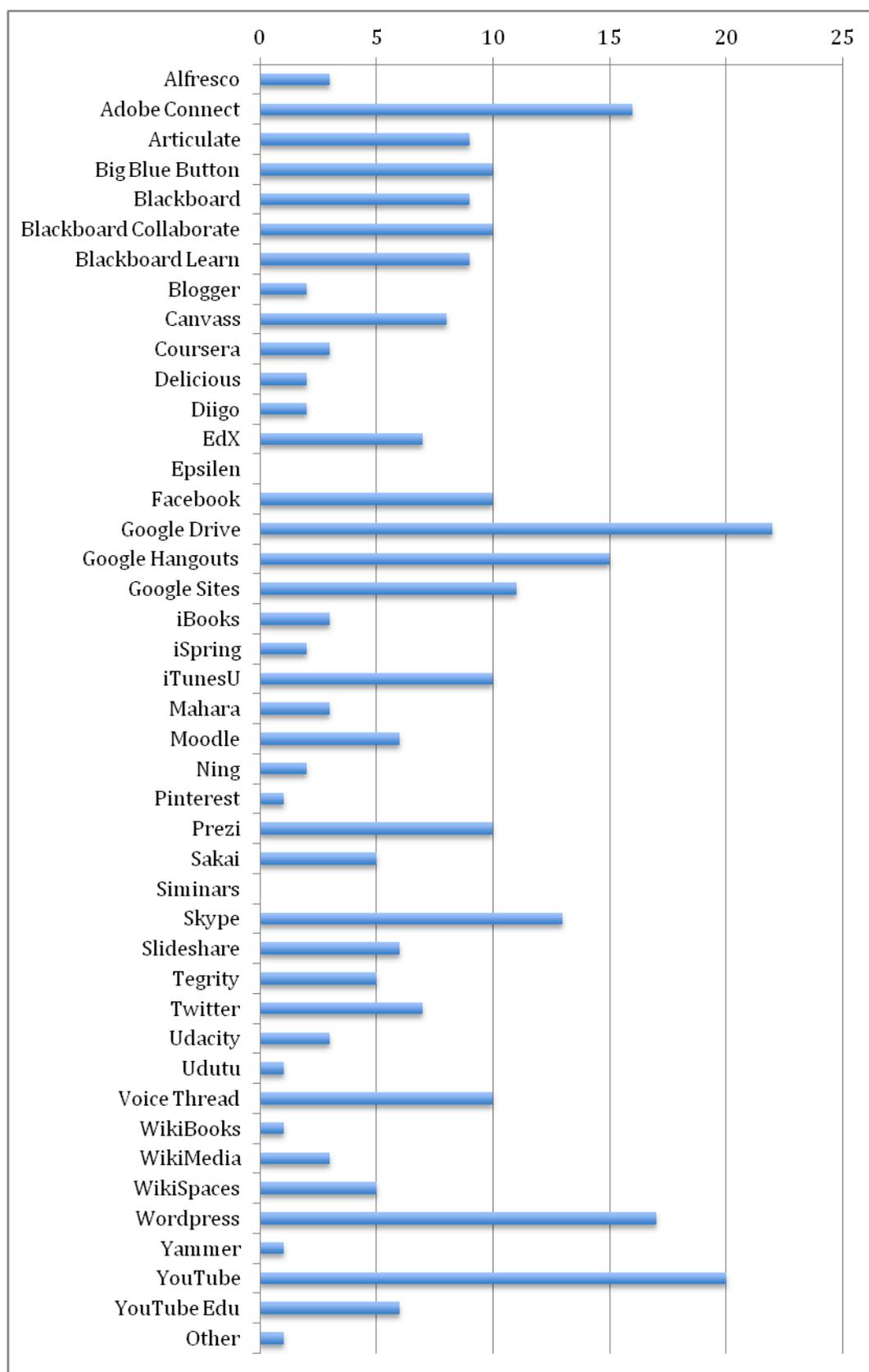


Figure 14. Platforms and Tools Currently Used by Participants for Online Learning

Next comes collaborative conferencing software; Adobe Connect has a slight edge over Google Hangouts, followed by Big Blue Button and Black Board Collaborate. In terms of other tools, YouTube and Wordpress seem to enjoy a good deal of usage. The following list shows the tools that were reported in a free-form text field. The tools that are listed in Table 9 are ones that are not a part of the list in Figure 14.

Table 9. Self-reported Online Learning Platforms and Tools

• Captivate	• Councourse
• Desire to Learn (BrightSpace)	• Digication E-portfolios,
• Drupal, EABSSC	• Echo 360
• ExamSoft	• Foliotek
• Google Classroom	• GoReact
• GoToMeeting	• iThenticate
• Jing	• Kaltura
• Kannu (LMS)	• Knovio
• Lynda.com	• Office 365
• Office Mix	• Omeka
• Panopto	• Raptivity
• Respondus	• Schoology
• Sharestream	• SoftChalk
• Storyline	• Tasktreem
• Techsmith Relay	• Turnitin
• Vialogs	• WebEx
• Workstream	• Zaption

Which types of tools are considered effective? The survey did not dwell on particular tools, as the brands of tools are always in flux. Instead the question that followed presented a list of tool types, with no specific names mentioned, to which participants were asked to rank what they believed were the most effective in teaching and learning. The scale offered the following options: very effective, moderately effective, somewhat effective, not effective, and unknown.

Across all respondents, the top three tools that were considered to be very effective were videos 73% (n=22), simulations 72% (n=21), and discussion boards 53% (n=16). Blogs and chats tied for fourth place at 50% (n=15), followed by social networking 43% (n=13) and wikis 40% (12). At the bottom of the effectiveness ratings were Podcasting, Drawing, RSS Feeds, and Social Bookmarking, all coming in at 10% (n=3) (see Figure 15).

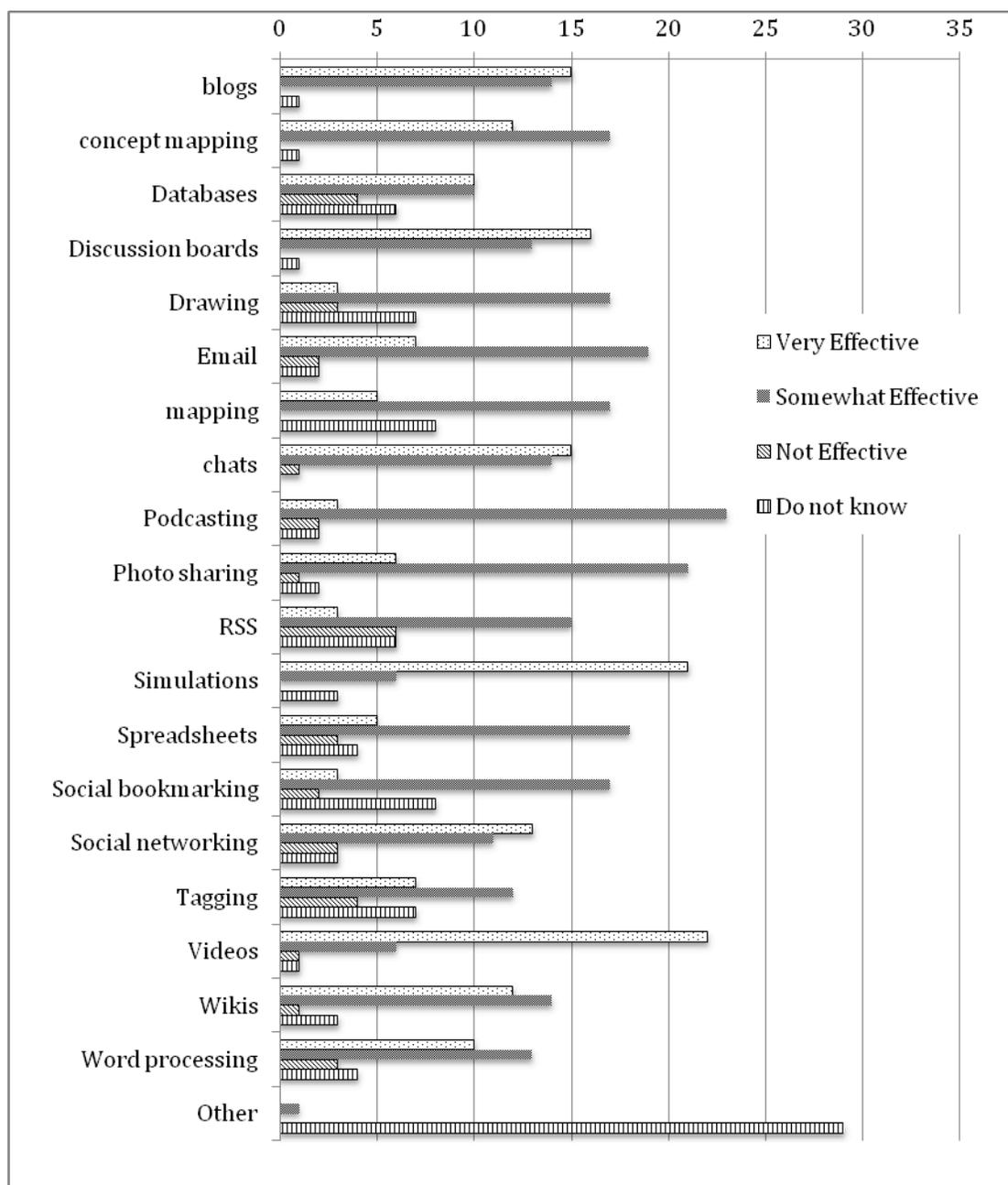


Figure 15. Effectiveness of Online Tools by Type

What influences the choice of tools? Subjects were asked to weigh how important certain criteria were upon their decision to purchase or implement a new tool. The question was presented as a Likert scale with the options of *not at all important*, *very unimportant*, *neither important nor unimportant*, *very important*, and *extremely important*. Figure 16 presents both the options and the preferences indicated by the survey participants.

There was general agreement that the *extremely important* factors were *student ease of use* and *faculty ease of use* (77%, n=23). This was followed by data security (60%, n=18), and then tied for fourth, *ease of integration* and *faculty recommendation* (53%, n=16). *Recommendation from peers* and *students* had an *extremely important* rating of 10 and 7, respectively. Most participants placed *recommendation from sales representatives* at the very bottom of the scale, 63% (n=16) saying it was *not important*, and 7 indicating it was *extremely unimportant*.

Regarding tool hosting, the ability to host the tools externally (e.g., the software-as-a-service) had 70% (n=21) of participants indicating it was either *very* or *extremely important*, as opposed to having internal hosting capability 36% (n=11). In terms of technical support, the importance of the availability of external support vs. internal support was very close at 76% (n=23) and 80% (n=24), respectively.

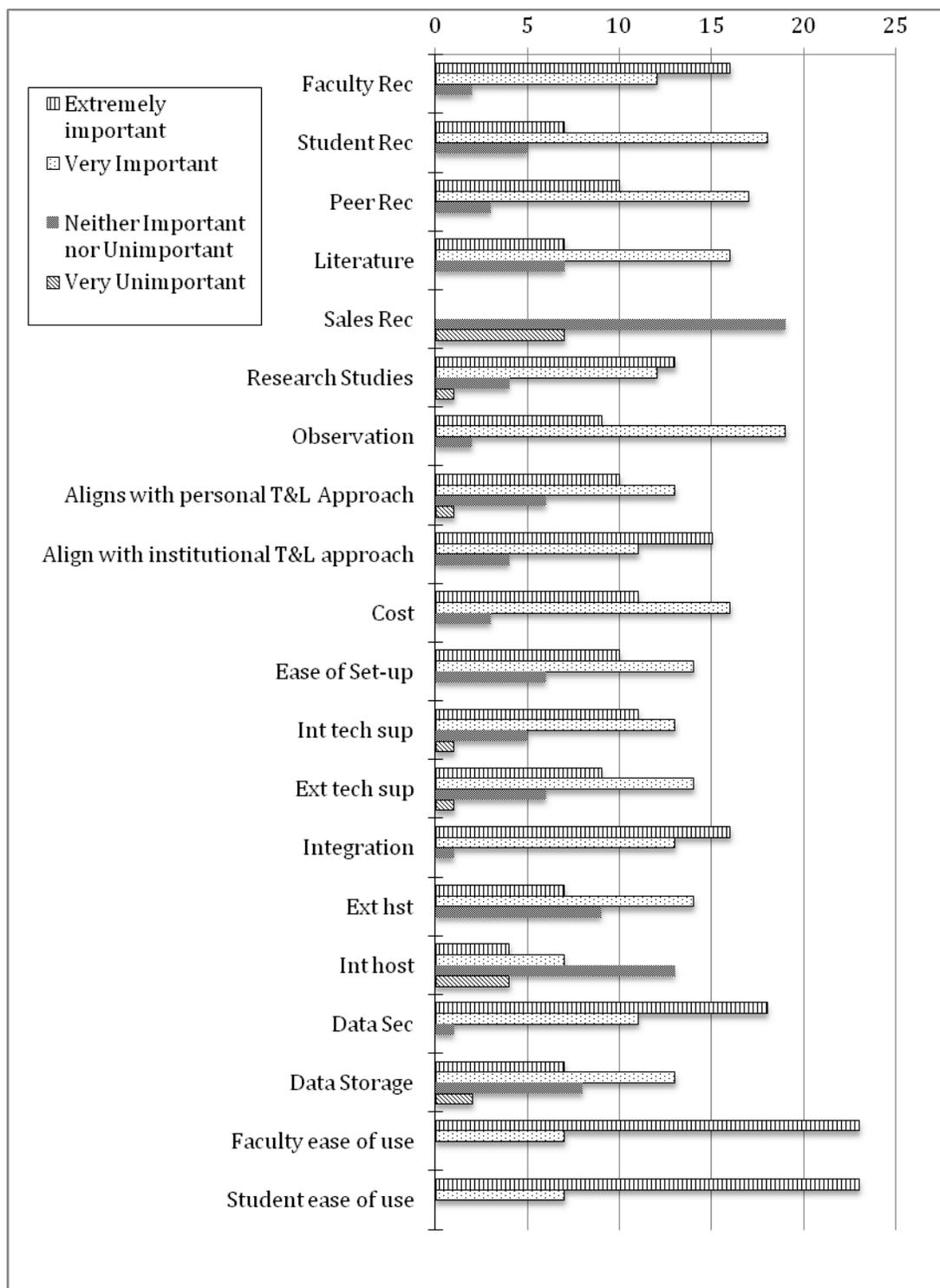


Figure 16. Factors that Influence the Selection of Tools, with Degree of Impact Reported by Participants

Top three factors. A follow-up question asked participants to rank only the top three factors out of the same list of options. Recommendation from faculty came in, cumulatively, in the top spot 47% (n=14), with 9 giving it first place and 4 second place. Interestingly, research studies came in second overall (40%, n=12), with 8 participants giving it the top choice, and 2 each for second and third place. Ease of use for faculty came in third overall (33%, n=10), split evenly between the first and second spots (Figure 17).

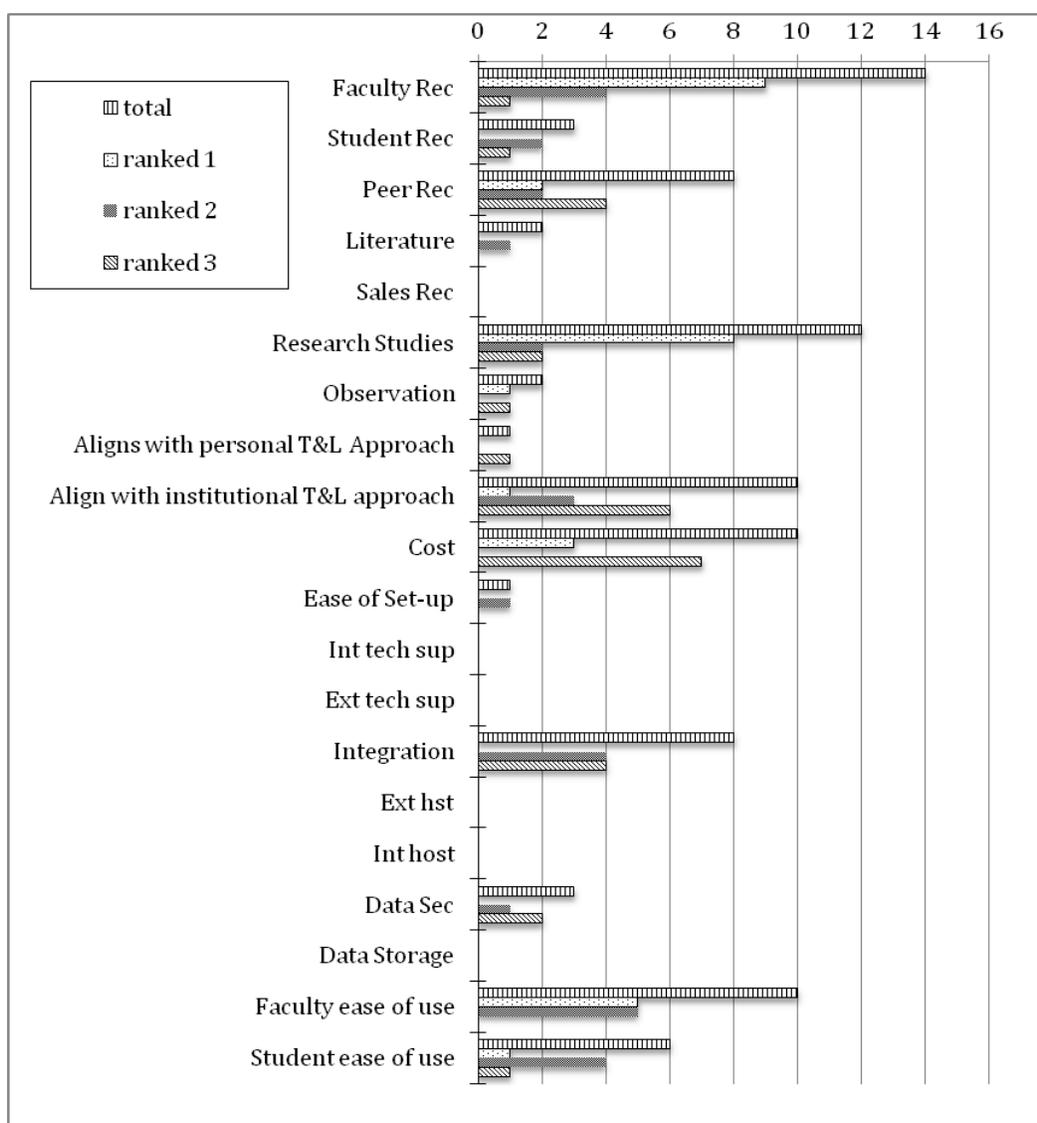


Figure 17. Top Three Ranked Factors that Impact Tool Selection as Ranked by Participants

When filtered for people reporting *satisfaction* with tools (n=18), *recommendation from faculty* was still the top influence (n=9), followed by a tie between *recommendation from peers*, *cost* and *ease of use for faculty* (n=10). Finally, *students' ease of use*, *integration with other tools*, *institutional approach*, and *research studies* all tied for third place (n=5).

For people dissatisfied with the tools (n=12), *recommendation from research studies* was in top place (n=7), *recommendation from faculty* and *institution's approach* tied for second (n=5), in second, and *faculty ease of use* and *cost* tied for third (n=4).

Setting the Boundaries

One of the areas that came up in the literature review was the ability of an institution to support the many types of online tools available to educators. An issue that Bates (2005) posed was that, with ever more new and different tools being created and released, how do faculty keep up both with technology, choosing the right tools to match teaching techniques and learning goals and not just choose them because they are new and interesting? To add to this, the next question could be: How does a college respond to support calls and training on new tools, which sometimes they may not even know are in use? To explore this question, the survey asked what level of institutional circumscription should exist for faculty tool use. The survey asked:

Do you feel that faculty should be able to:

- Use any learning tools and platforms tool they wish
- Use any learning tools that they wish, but must use the institution's learning platform
- Use only the learning tools and platforms that your institution provides
- Undecided

In the results, the majority (56%, n=17) indicated that faculty should be able to use any tool that they wish, as long as they use the school's LMS as the basis for the class. Following this, 20% (n=6) took a harder stance, indicating that faculty should only use

school-provided tools, while 7% (n=2) were open to any tools. The remaining 13% (n=4) were undecided (see Figure 18).

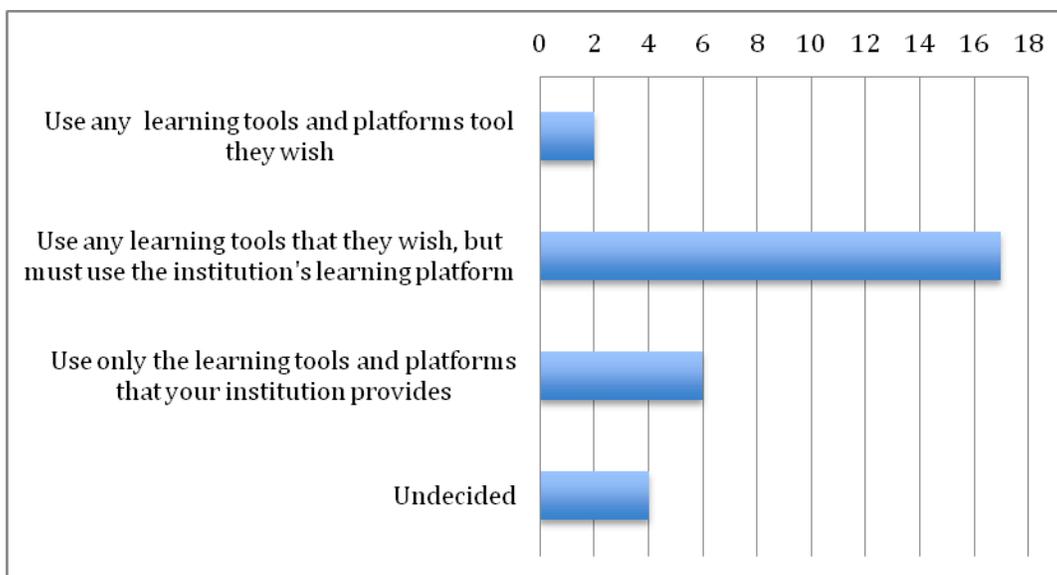


Figure 18. Putting Boundaries on Tool Use, Participants Indicating which Approach to Whether Faculty Can Use Tools Outside of Their Tested Systems

Filtering the responses based on having an IT background (n=15) yields similar results; however, in this case 3 of the 4 *undecided* participants have a background in IT. However, when filtered to the level of participants without any teaching background (n=3), only 1 was *undecided*, with the others indicating, “use only the learning tools and platforms that your institution provides.”

The flip side is to look at participants with no reported IT background (n=15). In this case, *use any tool* and *undecided* both received only one vote, while “use any learning tools that they wish, but must use the institution’s learning platform” received the majority (n=9) and the rest (n=4) indicated, “use only the learning tools and platforms that your institution provides.”

Outside tools. The next question asked about the awareness of tool use outside those that were typically supported or offered by the institution. Knowledge of the tools

being used is important for support, data privacy, and other reasons, which are topics explored further in the interviews. This was asked in the survey in the following question: *Are you aware of tools being used by instructors that differ from the ones that you currently offer and support?* It was asked as a yes/no, with a follow-up for anyone answering yes: *Do you know which tools they are using?* With yet another follow-up if the answer was yes: *Do you know why faculty members are using tools outside what you currently offer and support?*

Of the 30 respondents, 80% (n=24) reported that they were aware of tools faculty were using that were not all part of the college's offerings. Fourteen indicated that they were aware of the tools, and 10 said that they were not.

In the final question of this series, respondents were asked to explain further; these are their responses:

- The tools we offer are limited and they [the faculty] are persuaded by salespeople.
- Some tools just work well and are free and/or inexpensive.
- Personal preference
- Ease of use, more comfortable with interface, does something other similar tools don't, work around administrative quagmires, needs access quickly.
- Easier to accommodate non-credit and non-traditional students who are not easily tracked by the institution's registration system.
- Web2.0 (support their teaching styles and do not rely on the IT Staff)
- Local preference
- Email client preference; open source video capture—easy to use
- Experimentation is encouraged
- In most cases, it's something they have used before ... what they are already comfortable with.
- Sometimes I know the tools faculty try out and sometimes I don't (per the above question). Our tool set is fairly minimal and some faculty

enjoy being creative. When I worked at a larger institution previously, there was a lot of encouragement for faculty to try certain things from the instructional resources administration/staff and discouragement from the information technology administration/staff, so it sort of encouraged “rogue” behavior. Here, I think that some faculty are more adventurous than others and more interested in seeing if a cool tool might help improve some learning activity they might do in their courses. Faculty also get ideas from each other internally and their external peer networks and conferences. I have no problem with faculty who want to try tools as long as they don’t expect our tiny IT staff to support those tools should students have difficulty with them.

- Because the tools offer ease of use and functionality that aren’t offered by the LMS.
- They want capabilities we don’t offer.
- Personal preferences and prior experience with tools
- Some faculty just like to try new approaches and to experiment. They don’t like to be controlled and limited in what they can do.
- Independence, autonomy, don’t like what we offer (perhaps don’t know what we offer).
- Preference, experience from other educational settings

Finally, regarding tool use and faculty, the survey asked: *Does your institution regularly evaluate how faculty are using tools?* to which 46% (n=14) indicated yes.

When asked how the faculty’s tool use is evaluated, the responses included:

- Ask them through surveys, informal conversations, workshops, etc.
- Student Outcomes
- Through analytic data and regular feedback mechanisms including surveys and focus groups.
- Regular conversations and updates with faculty—especially those who are encouraged to explore.
- Course evaluations, mentoring
- Faculty survey each year asking how faculty are using tools.
- As part of the faculty member’s semester/course observation

- Annual survey combined with our experience in working directly with faculty
- Our instructional enhancement team continually evaluates this—both through surveys but also by watching the systems to see what they're using.
- Surveys and workshops.
- Mentor and/or team review

In the next section, data from the interviews will be presented along with themes and categories. The following chapter will consider some of the results found in the survey along with supporting, and confounding, statements from the interview participants.

Qualitative Data Results

About the Sample

The selection of participants for follow-up interviews was based on an initial review of the survey results, and subsequently filtered using a set of criteria that took into consideration experience, professional background, and satisfaction with tools. Participants who indicated that they were willing to take part in a follow-up interview were then grouped to ensure a representation of people with either a background in information technology (IT), in teaching, or both. They were then further grouped depending on if they had indicated satisfaction or not with the tools that their institutions were currently using. The rationale behind using these two criteria is detailed in Chapter III: researchers have noted a difference in perspectives on tool choice based on professional backgrounds (Bates, 2005; Jugovich & Reeves, 2006) and that satisfaction with tools is a useful method by which to gauge the overall perceived performance and quality of the tools (Keengwe, Diteeyont, and Lawson-Body, 2012). By selecting participants along these lines, it stood to reason that discussion would reveal a diverse set of opinions.

A breakdown of the interviewees' backgrounds and a brief biography of each follows. Pseudonyms have been used throughout to protect their identities.

- Interviewee **Brad**: is from a large, private, multi-campus university with an international reach. His school offers both undergraduate and graduate degrees. He has an extensive background in administration, some background in IT and teaching, and has been working with the administration of online programs for 5 years. He is currently dissatisfied with the tools being used.
- Interviewee **Jake**: works at a university extension. The university itself is a public, multi-campus institution that offers both undergraduate and graduate degrees. His background is exclusively in IT, with little formal teaching experience, and he has been working with the administration of online programs for 5 years. He is currently satisfied with the tools being used.
- Interviewee **Kate**: works at a large public college that is part of a state education system. Her school offers a great deal of online courses at both the graduate and undergraduate level. She has extensive background in administration, some background in IT and teaching, and has been working in online learning for 14 years. She currently is dissatisfied with tools being used.
- Interviewee **Pat**: works at a small private college that offers graduate degrees. Her background is primarily in teaching, and she has little formal background in IT, and has been working with in online learning for 18 years. She is dissatisfied with the tools being used.
- Interviewee **Scott**: works at a medium-size private graduate college. He has an extensive background in both teaching and IT, and has been working with the administration of online programs for 15 years. He is currently satisfied with the tools being used.

Coding the Interviews

A phenomenological study is typically broken down and analyzed through “horizontalization, meaning units, clustered themes, textural and structural descriptions, and a synthesis of meanings and essences of the experience” (Creswell, 2013, p. 226). Creswell emphasizes that there are no specific steps but rather that one should follow a “general contour” (p. 182). He presents the process as a spiral of procedures that a researcher moves through fluidly. The stages of procedures begin with Data Managing, moving up to Reading and Memoing, then to Describing, Classifying, and Interpreting, and finally to Representing and Visualizing (p. 183). The following is a brief description of how the survey data were analyzed in terms of this analysis spiral.

Significant Statements

The ultimate goal of a qualitative data analysis is to provide an “interpretation in light of their [the researcher’s] own views or views of perspectives in the literature” (Creswell, 2013, p. 184). To begin, transcripts of the interviews, uploaded into the online research tool Dedoose, were given several careful readings. Specific significant statements were identified, and often “memos”—researcher’s notes—were made and attached to the statements. The careful readings of all the interviews and creation of the excerpted significant statements help “to identify major organizing ideas” (p. 184). A total of 197 excerpts and 48 memos were created from the five interviews.

Coding

To begin the next sequence in the spiral, “Describing, Classifying, and Interpreting,” codes were created by the researcher and attached to the significant statements. The codes are short descriptive words or phrases that provide a way to quickly group the words and sentiments of the interviewees, and when used repeatedly, become a way to relate statements across subjects and organize the analysis. Creswell (2013) suggests keeping the number of codes limited, explaining that 25-30 is an

acceptable range (p. 184). After the initial coding, a process to organize the codes occurs, which Creswell describes as reducing and combining the codes into five or six themes (p. 185).

An initial set of 33 codes, seen in Table 10, were created during the readings of the interviews and applied to the texts. After careful re-readings of the interviews and codes, a final set of 21 were created and then grouped into five distinct themes. In the process of refining the initial codes, similar codes were condensed under a single one, and often the code's title was altered to better fit the combination. The next step was then looking at the 21 codes and grouping them into larger encompassing themes.

Grouping into themes. Creswell (2013) writes, "As a popular form of analysis, classification involves identifying five to seven general themes" (p. 186). He explains that the process he uses "involves winnowing the data, reducing them to a small, management set of themes to write into my final narrative" (p. 186). For this study, the theme "Leadership" began as an individual code, but when reviewing the significant statements and initial codes, the following refined codes emerged to represent the larger theme: *evaluation*, *institutional support*, *culture clashes*, and *educational quality*. Each of these codes represented some aspect of leadership and its challenges. *Evaluation* was a theme that was expressed—not by exact phrase, but by meaning—by three of the five interviewees who were in some state of evaluating, changing, or organizing their online learning efforts. Similarly, *institutional support* was something that came up from both a how-to perspective to what a lack thereof means. *Culture clashes* suggested the challenge that some of the leaders felt in their own institutions between how they were leading or how power-sharing arrangements were developing. Finally, *educational quality* came up as a leadership issue both in terms of it being the driving goal and what students are looking for. Not all of the initial significant statements or codes survived the "winnowing" process. And as Creswell mentions, the amount of data can be copious and some data will be "discarded" (p. 184).

Interpreting the data. The themes and codes serve to organize and help the researcher to ultimately make sense of the data and provide their interpretation. Before moving into this, a representation of both the initial codes and their subsequent refinement and clustering into themes is shown in Table 10. The left-hand column contains the initial set of codes suggested to the researcher during the reviews of the interview transcriptions. After generation of the many labels, they were grouped and

Table 10. Initial and Final Codes and Themes Developed during Qualitative Data Analysis

Initial, uncategorized list of codes	Final codes, grouped by theme
<ul style="list-style-type: none"> • Administration • Organizational structure • Subject matter expert • Open educational resources • Educational Resource Development • Instructional Design • Approach to Teaching and Learning • Tool selection • LMS • Technology Challenges • User Interface Design • Financial Resources • Tool Integration • Linking Services • Faculty Support • Information Technology • Creating an Environment for Learning • Data Security • Faculty Involvement • Struggle between IT and ID • Leadership Issues • Active Learning • Measuring Success • Assessment • Educational Quality • Instructional Strategy • Changing Attitudes towards Education • Student Support • Learner Interaction • Piloting • Scalability • Tool flexibility • Change 	<ul style="list-style-type: none"> • Leadership <ul style="list-style-type: none"> ○ Evaluation ○ Institutional support ○ Culture clashes ○ Educational Quality ○ Leadership challenges • Environment <ul style="list-style-type: none"> ○ Managing perceptions ○ Bridging divides • Instructional Strategy & Design <ul style="list-style-type: none"> ○ Contrasting teaching and learning approaches ○ New ways of teaching and learning ○ Approach to Teaching and Learning ○ Re-learning skills ○ Adopting social learning approaches ○ User experience (UX) ○ Flexibility and empowerment • Tool selection <ul style="list-style-type: none"> ○ The LMS ○ Tool integration & flexibility ○ Selecting the LMS, tools • Technology Challenges <ul style="list-style-type: none"> ○ Disconnects ○ Support ○ Data Security and privacy ○ Having a voice

consolidated under categories, and further aligned with the research questions, as shown in the right-hand column.

Leadership

The following excerpts concern significant statements around the role of leadership in online learning and changes at the institutional level. The category collects statements with the labels of *evaluation*, *institutional support*, *culture clash*, *educational quality*, and *leadership change*. Together, this category represents high-level statements regarding the organization and management of online programs, as well as the ways that online programs can manage perceptions and maintain educational quality.

One of the themes related to the overall administration of online programs was related to **evaluating** and knowing what the institution is doing, and wants to do, with online education. In fact, 3 of the 5 interviewees had comments that referred to reviewing the current state of their current online learning environments. Brad speculated from a high-level administrative point of view on how his university was exploring the online space:

So we ran a university wide pilot to understand what our capability was, we tracked all of that information. (B)

We put in place over the course of the last year (this was a goal of mine) university-wide categorization in collaboration with the registrar and provost so that at least we would know that we are categorizing courses in a common way as blended, inline or in person. (B)

Scott, also speaking at this broad level, but of a smaller institution, expressed some of the ambivalence institutions have toward online learning and how he was trying to address it.

All of the institutions I have gone to have been private universities, and [for] online, coming into a private university is almost sort of like this red-headed stepchild type of piece. Where it's like they know they sort of have to take care of it, but they don't really want to put in any effort. (S)

Currently what we are looking at—[CIO] and his team is looking at—is what would be all the costs associated with going big and online. (S)

Pat spoke from a more on-the-ground perspective and discussed the need to present a vision for online learning at her changing institution, and her frustrations with the response so far:

What I've done is created a project plan, more a business plan, for a Center for Online Teaching and Learning at [University Name]. Getting the Provost to understand what that means is still a challenge ... it's been very difficult. (P)

The other two institutions were farther along and no longer in the evaluation process; their programs had settled into a chosen approach. Kate's program has a strong professional model that supports their online teaching and learning needs on a large scale:

We teach at over 200 military installations around the world, and based on our needs early on, we served military student who are deployed, military student and adult students. We were one of the first universities to aggressively go into distance education and one of the first to go online, that's been our personality, we're not a university that three years ago said, "Oh maybe we should do some online classes"—we've been doing it as long as it has been possible to do it. (K)

Jake's school had recently gone through a major overhaul of their online program's technologies and policies, and they were now using their mandated toolset. The discussion veered toward about how it was working, with a focus on the practical outcomes, rather than trying to understand the challenges.

So the governance board does an evaluation and suggestions are made for the institution and then course out of our own research and our own evaluation done here in our office, we create a lot of those as well. Or any of the tools that we use in the classroom ... most of those have to be evaluated for the technical reasons for why it makes more sense for IT to manage them. (J)

Another issue that came up related to the **institutional support** of online learning in a way that is integrated into the work of the college. Brad explained,

So we ran a support pilot for a full year that just kind of said, "Hey, are our school based and central teams able to provide support if faculty are interested in innovating?" Because there was one big discussion around

“Well, I don’t want to do anything because the university cannot support me so I’m not going to get started and have my dreams dashed, when they can’t be achieved.” (B)

Jake mentioned the importance of having the support of the administration, which, when coupled with interested academic programs, can lead to a fruitful relationship.

We have seen year-on-year that our online division grows, so the public is certainly interested. And we do get requests from people to open up an online section of a course. Most decisions though are made at the program-department level; we sort of exist in the space after that decision. We do see increasing demands and periods of growth; right now our dean is pushing that pretty hard. (J)

Another theme that emerged was the notion of a **culture clash** between online programs and typical college operation and politics. Scott spoke to this issue on two fronts, between the wants of the university and reality of the environment, and the second as struggle between agility and IT resources:

Academia wants professional development programs and online to act like start ups, but they don’t want them to use start up models. So they’re often closed down because they can’t produce fast enough while being hamstrung by the upper admin and the faculty. (S)

Now with IT, I don’t know if they are capable of this, only because I don’t know if this is the way IT professionals think, is what implementation looks like. So how can you then make sure that within five years if all of sudden LMS go from being a course environment to a tool aggregator or something else, how do you make sure that you’re keeping on the cutting edge so that your LMS isn’t like 20 years down the road and everybody else isn’t using something else. (S)

And in one case, a **leadership change** may have a big impact on a program that has been running for many years at a school:

Now that my institution is merging, the future of online learning is going backwards. I am inheriting a large group that wants do lecture capture. So what I am seeing—what we are inheriting—is an institution, a group of folks that don’t know what their options are, and just want to broadcast what they are doing in their classrooms. (P)

In fact, for Pat it extends to a general misunderstanding of what instructional technology means at times:

It's been a bit of struggle getting them to understand that I'm not a technologist—although I'm a geek and I love technology, I'm not an IT-girl. It's that “no I won't fix your computer” and that Instructional Design is something that is on it's own and for me it's not IT, I'm a strategist, an instructional strategist and it's all about how do we find that solution to make this learning happen. (P)

Several mentions of **the quality of the educational experience** came up as an issue that bridges administrative and pedagogical concerns. Four of the interviewees mentioned this specifically:

People pay a lot of money for these things and not all of them have it to spend ... we have kind of an ethical obligation to do what we can to make sure were rewarding the right thing. (J)

But a student who is paying money, it's “what is really in it for me, what's in for me and what am I getting?” (P)

Because at the end of the day what the students want is the experience, and they really want strong transformative pedagogy. (S)

When you have a traditional university, you have tenured faculty, and each faculty sort of designing their own course. We can't do that. If we did that we'd be teaching statistics 500 different ways, and with 100 different textbooks, so we actually have a standardized curriculum. (K)

Each statement reflects a slightly different aspect of quality, namely, consistency and value.

Environment

The following excerpts relate to the theme of creating an “environment” for online learning at the institution and ideas on some elements needed for a successful program. There are two sides to this theme; one being how to support the environment that the institution provides for faculty and students, and the other is how perceptions from both internal and external audiences can affect the programs. The codes in this theme are **perception** and **bridging**.

It was of interest to see a theme emerge that pertained to the **perception** of online education, especially by one of the interviewees; however, overall, there is

acknowledgement of threats to the online program from the public, leadership, faculty, and even the tools. This is a multi-faceted concern in that ultimately the perception and acceptance of online learning will ensure its success and growth:

It's a cultural phenomenon now, if you say online education they might have value judgments that come into play—I'm sure you are well aware that not everyone thinks that online education is an awesome thing. (J)

I think for new people they are also gambling a little bit on the idea of how there can be a trade off against quality and so we have to be very proactive in working with students to exceed their expectations and ensure they are getting that quality experience. (J)

The success of a program (and its perception) is linked to leadership in how thoughtfully it is approached:

The folks that have been doing this there just rush and run and do something. They have not taken time to think beforehand and because—I think—there is no director of academic technologies, there has not been someone to say “Whoa, wait a minute.” (P)

and to how self-aware and reflective the program is:

In our case the big part of the success of our online service and the growth of them it is that we pay constant attention to the quality of content and always trying to improve and make it better and take the feedback seriously. Which gives them, I think, the motivation to keep investing in education. (J)

For Scott, hearing what the faculty have to say about the technology, and understanding it at a pedagogical level, is important, and in a way, the comfort and ease of technology translates to a better perception from students and faculty alike:

Faculty start saying, “I get so much more out of my students than when I had them face to face”; what they are really talking about is that they are able to facilitate a discussion, get them to think deeper, and produce more. But if they come in and the whole time the just stress over “Oh this doesn't work. I spend 15 minutes ... [fiddling with the computer],” then it constrains it, that's where the tool constrains, in some ways there is this ease of use piece that happens, but it is also that it needs to be connected, it needs to be something that you can get on immediately and that it works. (S)

While perceptions can help shape the success of an online program, the curating of the environment in which to grow a program is important in motivating people to work and learn. Scott laid out a distinction between the different approaches that can be taken towards curating the environment.

There are two ways you can do it, one is you can mandate it and corporatize it, and the other way is that you can grassroots it with the faculty and get them come to it and to have them really start thinking about it and then have them develop the missions so they really feel it was something they've done. (S)

On the grassroots side, Pat discussed how each faculty is encouraged to approach online learning individually:

What I have been able to do is to give faculty the support to run a successful pilot and understand what piloting is ... we're using this as a test, and one person can use it as a test. Then, we're going to look at those results and we're going to talk about those results and then someone else can use it. (P)

On the opposite side, Kate described how her college's professional scholar model allows them to achieve consistency and scale:

Our [adjunct] faculty don't choose books, don't choose assignments. They have some flexibility to alter some things, but in general they are teaching from a standard curriculum driven by our full-time faculty. So, that in turn allows us to make deliberate choices of instructional design at scale and technology at scale that I think some our traditional counterparts [cannot]. (K)

The idea of **bridging** divides came up in several interviews. It especially suggests that for online learning to work in the institution, there are perceived differences to overcome between faculty and administration, or between administrative and academic units, which also has ties to the earlier idea of *culture clashes*.

Brad explained the need for the institution, after evaluating the programs, to see how faculty could be best supported to deliver good pedagogy and not be weighted down with administrative tasks:

I think the divide has to do with two or three different elements. For all of us these are divides around familiarity—how familiar am I with pedagogical practices that involve technology, and how familiar am I with technology tools themselves. I think the demands on instructors’ time—a faculty member at a research institution demands on their time are great, and there is not always a ready opportunity to say, “OK, I am going to survey the landscape and who do I know to ask how to get the following thing accomplished.” (B)

First and foremost we have what I would call a “comfort divide”: Am I comfortable asking these questions, do I know where to go, am I comfortable with the tools that we have? Am I comfortable saying that I am going to take time away from my other responsibilities and interests as a faculty member or a dean, or a chair, and reflect on this and act on this (technology enhanced education)? (B)

Scott also mentioned bridging faculty and online pedagogy and tools:

How do I bridge the faculty who are going to be tapped into doing the program in way that gets them comfortable while also thinking about something as a student driven asynchronous experience which will mean a lot of things that faculty at the college currently aren’t savvy in doing nor do they have the technology support to do as such? (S)

Instructional Strategy and Design

The role of instructional strategy and design is pivotal in informing both the instructional design and subsequently the tools being selected (Kanuka, 2008). From the survey, it was known that all the interviewees were proponents of constructivist and social approaches to teaching and learning, which includes problem- and project-based learning, and, to a slightly lesser degree, discussion-based methods. This theme also gives us an entry into the ways teaching and learning approaches might impact tool selection, in that these are possibly important elements in determining the types of tools needed. The codes include contrast between *teaching approaches*, *new ways of teaching and learning*, and *re-learning of skills*.

One theme that emerges is the **contrast between instructional strategies**. Kate’s institution, a public college within a state system with a standardized curriculum and

approach to class delivery, gives her a unique position in relation to other online learning efforts where there is often much less uniformity within the institution:

When you have a traditional university, you have tenured faculty, and each faculty sort of designing their own course. We can't do that. If we did that we'd be teaching statistics 500 different ways, and with 100 different textbooks, so we actually have a standardized curriculum. So, that in turn allows us to make deliberate choices of instructional design at scale and technology at scale that I think some of our traditional counterparts ... I go to conferences and say this is what we do, they go, "Well, we can't do that." It's important context to understand that we're not the norm. (K)

This approach can be juxtaposed with Scott, whose perspective, coming from a smaller private college, focuses on individuals and letting faculty guide the conversation about instructional strategies and the toolsets.

So then it became what system do you feel more comfortable with? If you feel more comfortable using Moodle, let's make the decision for you to use Moodle. If you want to try something new, try Canvass.... In that conversation, why use Moodle, Moodle is here and Mahara connects to it, then when we're looking at Canvass and realize there's an LTI for Mahara in Canvass, so we can bring it in and they can also have the Canvass eportfolio and can let the students make that decision. (S)

Though both Kate and Scott agree on that there must be full-time faculty driving the curriculum, what occurs after curriculum creation is different. In Kate's case, professionals facilitate the classes developed by full-time faculty with the assistance of support staff; for Scott, the faculty are teaching the classes they have developed:

Sometimes we do have adjunct faculty do the development of courses, but they are developing courses to be taught by other faculty, not just themselves, and we pay them separately for that, it's not part of their normal teaching duties. How curriculum development basically works is that it's either a new course or a revised course that a faculty member has identified as a Subject Matter Expert and that person works with typically both the instructional designer and a librarian in my team to help think through the course. (K)

Even if it's not faculty driven, it should be faculty guided, there should be somebody there who is engaged with the institution and understands the institutional mission, and not just institutional mission, but departmental and

programmatic mission that at the end of the day they are not just cookie cutter programs out. (S)

As Kate noted in the interview, her school's approach is atypical in higher education, but offers a different approach when deciding how the school will be set up, especially in light of new technologies such as MOOCs. As Scott noted, online education can be approached in many ways, one of which is rejecting a more traditional university model:

They think, "Fuck it, we can't deal with the institutional way, and the way that BS works, the faculty, etc, so we're just going to turn the college into an online college and run 30,000 courses" or we're just going to let Stanford open up their own Udacity or whatever they're doing, or Harvard, let them do EdX, that's just it, they're going to do their own thing, we're going to sink or swim. (S)

Embracing **new ways of teaching and learning** was a theme that appeared under different guises during the interviews. For example, Pat, whose school was being acquired at the time of the interview, spoke of the challenge ahead to get the incoming faculty to really think about the online teaching methods as something new and different. For Jake, a change in the LMS was a way to get at how faculty were thinking about teaching online:

So what I am seeing—what we are inheriting—is an institution, a group of folks that don't know what their options are, and just want to broadcast what they are doing in their classrooms. (P)

I think that there were a lot of instructors who were very unhappy when we brought in the new regime and forced everyone to go through training. We used the change of the LMS as the excuse to do that, and we did a lot of things that basically forced them to step up their game and not all of them were happy about it. We definitely had some self-selecting that occurred. (J)

In fact, Jake discussed how technology is used to shape the behavior of the faculty teaching:

We actually have triggers and alarms that trigger emails that get sent all over the building if an instructor doesn't log in and interact with their courses in a given amount of time, which varies within each subject area

from 24 to 72 hours. Usually 48 is roughly the target and that's what we usually put in the contract as well. (J)

Kate, who works with a much different model of higher education, has the experience of the school as a whole thinking about online education as top-down. The faculty are professionals in the field, bringing experience, not necessarily pedagogical design, to the courses:

One of the things that make us unique is our faculty model is a scholar-practitioner model. Meaning that we really seek faculty whose day-jobs are in the field that they are teaching in. (K)

Finally, there is a sentiment that learning online is not easy, and a **re-learning of skills** is required to be successful in online learning, whether it is a change in perception to the difficulty of learning online, to the need to relearn well-honed skills and break old habits:

And I will say that I do think that there is a perception that some people have that online is easier. Generally, I hold the view in the other direction, which is that online courses are harder than in-person classes. You are learning so much more—that reality is rarely understood. (J)

I don't think those ways work [lecture, direct instruction]. But it all depends on how you measure success. If your goal is to teach facts and to have those facts repeated back, then lecture works pretty well for that, but that's not really what we're impressed with. (K)

We have plenty folks who are highly intuitive and experienced around building learning materials in class or online, that respond to this. Even if they haven't thought in awhile about constructivism or learning theory, they know they are great instructors or great researchers and so they understand what that process of building knowledge is about in a pragmatic way and they are replicating that in their courses. (B)

Teaching online is like you are a first time teacher again, and if you can't take the time to really explore these things and understand how students can be successful in these spaces and doing these things and doing them online, then you'll never be a good online teacher. And the tools have very little to do in relation to the overall thing. (S)

The social aspect of online teaching and learning was something that came up repeatedly; all of the interviewees had something to say in support of **social teaching and**

learning techniques. This was captured well by Jake, who referred to the notion of all the information being easily available, but without the social component, it isn't as meaningful, and Brad, who feels that technology makes constructivism a potent tool if used well.

Occasionally we'll get students who will say, "Why can't I just do this for free on YouTube?" Well, you can, you can get the information but will you have the guidance, the mentoring, the ability to work with someone who is well experienced to help you overcome all of those micro obstacles, and practice the muscle memory and training, and those things that go with the transmission of information? (J)

I think there is also—and I think this a cultural prejudice—but in online learning there is an emphasis on procedural learning and not all learning is procedural. (J)

The flexibility of an online environment can be responsive to constructivist-learning interests. You can reach out readily to people, you can consume different types of information: short, long video, text, audio only, collaborative learning live discussion boards, the flexibility of the online environment can be helpful if we help instructors leverage that. (B)

For instruction, all of the interviewees discussed the importance of the **user experience**. Pat is particularly adamant about the aesthetics—she believes in a beautiful system. The aesthetics of the technology is an important part of learning, but she is also not hung up on tools being "meant" for something and used only in that way.

The teaching experience goes to two parts—its instructional design and to me, it's got to be beautiful. I dream of a beautiful learning management system that is attractive visually and is a well-delivered user experience. (P)

I think that it's my approach to a more constructivist teaching and learning environment, online or in the classroom that led me to look at the tool last, or look at all the features of something and say, "Hey, that would be good for x," instead of just finding a tool and using it. (P)

However, for Scott it is more about the functionality and not the actual aesthetics, which he said plays a subsidiary role:

My concern isn't the overall online experience in terms of is the most beautiful, does it have all this branding to it, is it the most [aesthetically pleasing] experience online? Because at the end of the day what the students

want is the experience, and they really want strong transformative pedagogy. (S)

I spent some time working with eportfolio in Canvass. For me, I didn't find it a pleasing experience, but I'm realizing that once I have the technical mind-set of the tool, I can work with it. (S)

Jake believes that the tools need to fade into the background; tools need to empower people to communicate and also be enjoyable to use:

Finally, do people find all of this pleasing? Or does that thing that fade into the background in a way that helps them? It's like when you talk about someone coming to a meeting, if you provide food, everyone is in a better mood and that reinforces the good vibe of the piece. In a tool in a peer learning environment, is it pleasing, is it cluttered? Does all of that fade into the background to create a positive context for learning to take place? If you are frustrated with the tool, odds are that even as you're learning the thing, a part of our brain will still be dedicated to harboring some resentment. We really want the whole person to engage in the process ... so those are things we all take into account. (J)

Interestingly, Scott spoke about how instructors often reject well-worn tools like the discussion forum, not because discussion is new to education but rather because instructors do not want to put in the cultivation time necessary to make them work.

I want to have places where students can have conversations and develop socially. That's where real engagement happens. I like forums a lot, even though people tend to bad mouth forums. (S)

... the reason why people bad mouth forums is that no one really wants to take the time to really get students to understand what a forum conversation is about. Everybody is just like, "Oh, it's just so blasé, they just post a paper, I can't ever get it to be real." Well so then, work on it. What does really look like? The teachers have to be really engaged to talk to the students about it. And I don't care what anybody says, no classroom experience is like every student is talking non-stop and making the most amazing statement every time they say something. It's the same. You're going to have students in either space. (S)

Brad noted the user experience (UX) as well, but from more of a "bird's-eye view" of how user groups responded to the learning environment:

We did a pretty big training effort and some enhancements last year to respond to that because the students were highly satisfied and they wanted uniformity and the faculty were less satisfied and wanted as much diversity

and flexibility as they could, but from a student experience standpoint, the students indicated that they would prefer not to have to go to four different learning management systems to get to their materials and don't want to have to experience four different interfaces to access the information that they need - particularly the undergrads. So we have a little bit of an opportunity to figure out how to explore this with students and faculty and address what the sum of the tension that may exist between flexibility and UX. (B)

One of Kate's comments also suggests the concern for an integrated user experience:

One of the challenges in higher education is that we very much show our backend to our students and faculty. They know when they are in the LMS—a good example would be to take a typical online math class that uses something like Pearson's MyMathLab—there are three thousand universities that use that product. Students in an online space will typically have a campus portal which is the webpage that the University controls and authors completely that has their financial aid and other kind of information on it, maybe their degree plan, their email functionality may fall under it, but if they click on email it takes them to different place, because it uses another service like Gmail or Outlook, then they go into their class and now they are in the LMS, Blackboard or Canvass or whatever it is, now they have to do their math homework and then they are in MyMathLab and if they are lucky, their University has done central sign on—if they are lucky. (K)

Brad talked about instructional design in terms of the university as a whole moving forward. He presented a view that acknowledged the need for flexibility of the tools and the **empowerment** of faculty, but also to be able to support and help the learners. This is a sentiment that was echoed by Jake as he discussed empowering students:

In a discussion about systems, this is not about instruction. While we are trying to do such a great job moving forward to make sure that faculty feel they have a lot of flexibility in how they want to teach, and deliver the course, so that they systems are minimally constraining as they can be. (B)

That is where we are all looking for balance in how to sustain a set of services that are flexible from an architectural stand point, secure and reliable from a data standpoint, and still allow for some innovation. For us, it's building that architecture that you can add things in and take things out as they are needed. (B)

Another piece of it to make sure that in general that it's empowering, make sure that people are—for example, if they are working on a group project they need to be in communication, and they need to be able to do it

well, and preferable in a way that fades into the background so that they are not thinking about the tool, they are thinking about the content. (J)

Scott and Pat, who focused more on faculty experience and empowerment, also embraced the idea of flexibility and letting faculty guide the conversation about instructional strategies and exploring the toolsets:

I think you need to have access to open tools for the faculty where they can go an experiment and not feel like that they have run off the range. That's what I love about Google Apps—it really gives you a way to say—instead when people like I just found this new tool let's buy it—you can say, “Oh, sorry, well you didn't like WebEx, would Google Hangouts help you? Maybe you would just like to try a Skype with this? Maybe that would be all you need.” (S)

In our meeting yesterday we started talking about “how do I do this,” and the first focus is that they want to talk about the technology but then it starts to have to do more with the pedagogy. (S)

Faculty who come in may need anything ... for me technology has always been the tool that we slap on top of what were trying to get done. So I've set up the environment that I'm working in to be that way. (P)

Tool Selection

Discussing tool selection, the interviewees typically delved into subjects such as tool integration, tool flexibility, and, of course, the **Learning Management System (LMS)**. This part of the discussion focused on how the actual tools were selected and the factors that impacted their selection. The conversations involved particular tools and tools writ large. For example, Kate discussed a “trap” that institutions often fall into regarding purchasing an LMS as well as the reality of there not being an out-of-the-box solution:

I think as an institution we fell into the trap that almost every institution falls into when they are going online—and maybe it's not fair to call it a trap but you sort of go “OK, I'm going online, I need an LMS, and there is a thing called a CMS that someone that some said once, I think I must need that too.” And you have vendors lining up, saying, “Oh you know Blackboard can do that for you, or whatever ... Canvass ... etc.” (K)

What I think has ended up happening in this space is that everyone searches for an off-the-shelf solution and then once they really get into it

they find out that it doesn't really work all that well, because it was not ever geared to what their functional requirements were. (K)

Scott also touched on the idea of the trap, but in terms of it being more a shifting target. The trap becomes inverted, and the issue becomes getting into one system and then having to make an organizational and technical shift to another system:

I've never been anywhere that we haven't changed LMS within three years. Any school. At [first institution] we went from Virtual College, which we developed, to Epsilon, and now it's Sakai. At [second institution] we went from Pearson to Blackboard to Sakai. At [third institution] we went from Jenzabar to Epsilon to Jenzabar, at [current institution] it's been different, they just keep on bringing in. (S)

Interestingly, in Scott's situation, he has more flexibility because his institution keeps "bringing in" new LMSs; he said: "I like my current LMS situation. Which is just that I can just cherry pick from different LMS, that's something I've never had before."

Moving away from the idea of a trap, Jake and Pat expressed more ambivalent attitudes toward the LMS:

It's not like I'm going to say "Yay, this ... is awesome." I actually think that there are some big problems with the LMS and with the way some things are currently handled. So in that sense I'm a little dissatisfied, but our tools, in comparison to what is available in the world, I'm pretty happy with what we've got. (J)

The LMS usually is given to you at the institution you are at. I've been through two or three new LMS integrations, but I wasn't a part of the selection committees, I just came in at the end of when they were doing that. For me, and I've written about this, it's "what do you want your students to learn, how do you want them to learn that, and how do you want to interact with them, and then, how are you going to assess their learning." (P)

The next topic that appeared in several conversations is the ability to integrate the tools into an environment. **Tool integration**, often coupled with the idea of flexibility, appeared in several guises but was essentially stated in opposition to the idea of a monolithic LMS. As Kate explained, she would rather see a tool that can integrate seamlessly into different LMS. Kate, Brad, and Jake discussed tools as a "eco-system," where data flow seamlessly throughout:

I think there are some great tools out there, but again it depends on what you are trying to accomplish. The best tools are the ones that play really nice in other platforms and that can be integrated seamlessly that can sit there and do their part without any users understanding their part in the ecosystem. (K)

We've been talking for a while about using technology in new ways to teach and we've got new ideas that involve newer technologies and we'll be able to do good stuff there, I mean ultimately I think that whole lot of things like LMSs and a lot of the software is just a front end on a database anyway. So if we can keep the database part but maybe make the interface more in line with synchronous content, while also gaining the advantages of asynchrony and distributed content, I'd be excited for that to happen. (J)

What I see on the horizon ... is a much more flexible architecture where we have really a Learning Management Ecosystem and that's going to include some of those basic administrative tools that are going to link you in and have that kind of robust security and roles and responsibilities that you need. Then you also have an ability to clip on, and add in to that flexible system, tools that may be needed by certain programs or disciplines or new approaches so that people can share video, and tag it, or use text messages, or people can annotate information and generally speaking those needs are not going to be met by one tool. (B)

The term "flexible" is used to mean both that a tool can be used in conjunction with other systems and that the people using/supporting tools are able to take on new ones without issue. All the interviewees had input on the topic. For Brad, integration and flexibility have to do with consensus and support of the university as a whole:

That is where we are all looking for balance in how to sustain a set of services that are flexible from an architectural standpoint, secure and reliable from a data standpoint, and still allow for some innovation. For us, it's building that architecture that you can add things in and take things out as they are needed. (B)

For Jake it is being able to provide faculty with the tools they need:

Sometimes people have an out-of-pocket solution that needs to be evaluated in relation to a particular class of software. For example, telecommunications, we already know what we need to know about WebEx and Adobe and Skype, there's the whole lot. We don't have to think too hard about those things, but sometimes unique challenges come forward and we have to spend a little bit more time evaluating those, and depending if it's within our domain, evaluating it in-house here. If it's institutional, then we participate in the committee through the IT department. (J)

For Scott it has to do with nimbleness in the support available for supporting faculty with online learning tools and a LMS:

I don't think you can say you're going to use the same LMS for 100 years. So really the better model is how are they are going to meet that challenge, that either a new system is going to happen every 3 to 5 years. (S)

My dream environment would be an institution that would be flexible enough to bring in technologies as they become relevant and also focused enough to understand that the online program needs to have a certain experience to it. That experience can be pedagogical, but I think any student coming into it—I want to remove the technology burden on the students so they notice how strong the pedagogy is. (S)

While Jake had a great deal to say about tool selection, most likely because he was instrumental in choosing the tools currently being used in his program, everyone interviewed had some input on how the **LMS and tools were selected** for their program:

I think I'm in a somewhat unusual position which is that basically that when I took over here part of the goal was to switch the LMS and get things up and current and the fact that I'm happy with the tools probably has to do with that I was able to select almost all of them. And I wanted almost everything that we use. (J)

Brad discussed how the IT consulting firm Gartner helped their university look at LMSs from a global use perspective, only to find that there really was not a significant difference between the systems:

We worked this year with Gartner on an external review and also some interests groups both in [city] and [city] to try to understand some of the LMS of note, this year we put together a rubric of evaluation that Gartner helped validate and review and what their results suggest are that there are minimal differences between some of the core LMS administrative systems, the systems that connect to your Student system and help you do grade books and rosters and what we call add/drops and stops, those elements that extend to grade books, basic quizzing functionality, lessons, tools. (B)

Scott has an interesting situation where the tension between role of the IT group and his group, and with the faculty as a whole, leads to some breakdowns in the decision-making process:

How are tools selected at [institution name]? That's really a great question. Either IT makes a decision that they need a tool because they think it's cool, or somebody showed it to them, or a faculty who they have a good connection with is asking them for it, if any of those things are not in play with other faculty, so say if you have this other faculty who wants to use Schoology, or if you have somebody who doing like an [program type] online program, and they seem more problematic, then they get to make the decision, and IT stays out of it. Because IT isn't in the business of helping people change the way in which people think, they are just in the business of buying tools. I've never worked in an institution where IT wasn't the ones in charge of the tool selection. (S)

Kate, whose school was conducting an LMS search at the time of the interview, explained the process her school was using to evaluate the next LMS system. Based on a needs assessment and a pairing with the LMS, she discussed how the focus was on a core set of functionality:

We're really starting off with functional requirements. We looked in the past and we said we need an LMS, OK let's go look at LMSs, OK we saw there three, I like that one better, let's go with that. Now what we're trying to do is determine what are they key things that we need to do. We have a very long list, and it may be that there are a hundred items on the list, and maybe our LMS does five of those things. Which is fine, if it does those five things really well, let's put it in the backend and let it do it really well, but let's not just sort of say it will do these five things and we'll let it do these other twenty other things poorly. (K)

Kate also suggested that the driving factors should come from a needs assessment that looks at the functional requirements, and the interworking of multiple tools is more important than finding a LMS package that almost meets the needs.

What we've done—and in the process of doing is we're trying to move away from this “we need an LMS, we need a CMS, we need a student information system.” We know we need aspects of all of these, we know we do, but we're trying to go back to the functional requirements at heart, and say, “What do we actually need to be able to know and do? What do students need to be able to know and do? What do faculty need to be able to know and do, with and through this technology?” and having that then guide our solutioning so that we can say “in the future, all we really need is the gradebook functionality of an LMS and maybe that floats into another user interface that comes from some other place.” (K)

For Brad, having a school-wide strategy that takes into account licensing arrangements is key. He sees the learning platform's selection from a holistic standpoint, saying the driver lies with faculty and whatever is the school-level strategy:

So for us, we first had to accept that there is a continuum and it will have a whole bunch to do with individual faculty interest, school, programs, and where a school level strategy is, and all of that should drive what tools and what structure you have the tool, license arrangements and all that stuff. (B)

Scott discussed the more difficult nature of the situation at his institution. With competing interests and budgetary limitations, his requirements are looser, and he defers to having a system that faculty feel good about using:

Again it goes back to my agnostic viewpoint on technology overall, [it's] just that they [tools] are serviceable and that faculty feel comfortable using them. We are going through an LMS review, but it really has hit a wall because the way in which the decision is being based is being based on finance, I would say. (S)

Technology Challenges

Tucked under this theme are the issues and challenges that provide a practical aspect as opposed to the theoretical use of tools. Issues that surface here hint at the challenges that technology and the people tasked with supporting it face. The codes include *disconnects (between IT and ID)*, *data security*, *student and faculty support*, and the need to *have a voice* in the tool selection process.

As Kate succinctly stated, once the organizational, pedagogical, and support issues are taken care of, the biggest challenge is the technology itself, and again, to go back to the technology is “not a one size fits all” product:

I think I spend most of my time thinking about the technology and how we can get it to do what we need it to do over anything else. The curriculum, we have Subject Matter Expert and we know good instructional design, we have the content. It's really the technology that's often the challenge. (K)

Though not specifically a “technical issue,” the idea that there are **disconnects** between instructional design and information technology came up in a few of the interviews. The reason to see this as a technology challenge is that it seemingly impacts the general understanding of technology in education. This came up most in the discussion with Scott, who explained how he was working on defining his role at the college versus the role of the IT department. Resources appeared to an issue; as did a need to better define the roles of online learning and computing technology:

I have the difficult task of making sure that the tools that are selected are relevant to the way in which the program is developing at the college. In other words, currently we are looking at—[CIO] and his team—is looking at what would be all the costs associated with going big and online. (S)

I would say that the challenge is that on one hand, the way IT thinks is in price. How much does this cost us for how long? So they have to sort of plan out for that. But at the same time they want to also to have things happen really quick. They have everyone at the institution saying but this is technology, things can happen quickly. So they’re spending a lot of money for things.... (S)

One of the things I have been trying to do is look at online at the college as becoming more service oriented—how does new program initiatives become a service model. Which I think is making a distinction from what IT does which is supply and support model. (S)

Jake’s perspective comes from a school where the roles have been better defined. He explained that the IT group of the university provides access-level services, like logins and servers, but his group acts as the approver and supporter of the learning tools:

There is probably three ways that I’m involved with that. First is that we have a relationship with our IT department that basically allows us to manage our own equipment and services. They do all of the contracting and purchasing, and for basic user work operations they are still in control. Essentially, IT helps to the point of log-in and that level of integration, then we run our own tools and platforms. (J)

So the governance board does an evaluation and suggestions are made for the institution and then course out of our own research and our own evaluation done here in our office, we create a lot of those as well. Or any of the tools that we use in the classroom ... most of those have to be evaluated

for the technical reasons for why it makes more sense for IT to manage them. (J)

Brad's technological challenges were more support- and resource-based and represent a reconciliation between groups. In the evaluation process that his university underwent, areas were identified that were under-resourced and needed attention in order to provide a stronger platform to support instructional technology:

I felt that we were not going to make the kind of progress that folks wanted to make without school based resources to compliment the central teams as well. So any of the schools that did not have any support for instructional technology, for teaching and learning tools and the pedagogical elements around that, the provost supported the faculty committees recommendations and allowed us to create positions at 10 of the schools that did not have any kind of support because again, I felt that the support pilot and our conversations with the deans suggested that we needed this combination of school and central resources. (B)

From Pat's perspective, there is no disconnect the IT divisions and the ID teams, perhaps due to the small size of the institution; she feels the personal relationship she has with the IT director is an important factor in this:

... bringing in any new tools or new technologies isn't a struggle, it isn't a fight, IT is also one gentleman with his consultants working for him, so, we need each other and we're nice to each other. I know there's a lot of time a struggle between IT and the instructional design faculty, but all of these pieces are missing where I am. (P)

Support is another item that came up several times, with slightly different emphases. There was the idea of "helpdesk"-like support that Jake spoke of in terms of service to the learners, then there was the level of support that Kate discussed in reference to the issues that a tech vendor and LMS integration pose. Taking a step further back, Brad discussed being able to support schools within the university:

We get the call, the instructor doesn't. When the student can't figure out how to install the actual software or can't figure out how to use the tool, and if we don't know it's being used, we can't help them, and then suddenly they're calling the number for the help desk. If this is your entire experience at [Institution Name], that's not a good situation, so a part of it is a customer service. (J)

On the other hand though ... the instructors aren't always possessed, in every case, of the expertise to select a preferred tool ... they don't all have the kind of experience where they know how to work with them in conjunction with our system (J)

A particular vendor we work with have a planned six-hour outage every other week. They do it on Sundays from 1 am to 7 am, because their logic is that everyone is asleep. We have over 10,000 students in Asia. That's right when their assignments are due, that's Sunday night. Every other week, all of our students in Asia, and as many students in Europe (they're American students in the military living there), just when assignments are due, our platform goes down for all of our students overseas. I'm not trying to pick on one vendor, but when we bring that up, they say, "Well, we need that gap time that there is no better time." So we have issues, and again, it's somewhat of a higher education problem. I cannot name another software or any kind of platform outside of education that would say that it's okay to have a six-hour outage every other week. (K)

I have challenges with our technology in that we have, as everyone has, been a little constrained by our options. We have sort of had to have an LMS, so you pick the one that is closest to the one you want, but it's not going to be everything that you want. Then you layer a bunch of code around it to make it do exactly what you want, but that makes it clunky. You have to have a student information system, so you get that, and it interfaces well for some things and it doesn't interface well for other things. The only alternative is to create your own system, and that's a nightmare as well. You know it's really good to outsource technology solutions to technology companies, but I wish that more industries and companies saw education as a good space to come into. (K)

Brad discussed support as a part of the process, a way in which tools that are introduced into the "eco-system" can be evaluated, tested, and supported for wider adoption and use:

So that's kind of a balancing act, and I think that what I like about where we are now is that it's a discussion, an open discussion, and we want people to feel comfortable to say, "I've been using this" ... last year in our conversations there were six or eight different tools that faculty or departments or programs really liked and we put those through some technology security paces and then we integrated them through LTI integration—a particular architectural integration—into our Sakai environments, so they could use those. Those became a part of our Tier 1 support structure. So we needed be more agile in order to be responsive to meeting faculty in this regard. (B)

Jake talked about the challenges of being on the front-line supporting technology to ensure quality experience:

Plus we haven't tested the tools, and we don't know how to support the tool. Usually if an instructor comes to us, we either able to find something that we already have and already paid for, or we're able to make particular arrangements and train our folks on how to support it. (J)

Scott discussed the ramifications of poor support on a program.

All of things need to have IT tech support on them in some sense, unless you have that 24/7 to work with them. I am starting to realize that faculty probably do at least need early on sometime of resource / media development support. Whether it is video, classroom set-up, that type of stuff. After that I don't think anything else is all that relevant. (S)

Another factor in tool selection is **data security**, which can include topics such as keeping data secure, protecting privacy, and authenticating users. This topic expressed itself throughout the interviews. Brad provided an institutional level view of the challenges of creating consensus around selecting systems as well as being cognizant of data integrity:

This is not a question about academic freedom and how you teach, and what you teach and the structure, but the student data that relates to academic progress and personal data is important to everybody, and so I think we want to try and understand if faculty or departments or programs are using fully external systems, what are some of the drivers and how can we make our systems be more responsive so they can accomplish what they want to accomplish in their course and do with the reliability and security that we all want to see student data attended to. (B)

Mostly for compliance purposes, first and foremost, because no institution wants to see student assignments and student work stored, and managed, and commented on in unsecure environments. [Institution name] has a global footprint and we're super conscious of where student data that relates to grading and to their programmatic progress, lives and resides. I think that is an opportunity for us to help instructors think about this student data and how that is governed and managed. (B)

Jake similarly discussed how they had discovered improper usage and privacy risks related to how tools were being used. In this case, he also spoke to the notion of circumscribing which tools can actually be used:

One of the things that we discovered too is that a lot of the [external] tools that instructors wanted to use are capturing information about the students, either forcing them to volunteer or forcing them to the instructor who then passes it on to a third party. We take a very very very conservative approach to FERPA, HIPPA and everything. And rightly so, we should always be constrictive and wary and keep the student information as private as possible. (J)

Pat discussed this topic not so much concerned privacy or security, but about proving identity online. She explained how she feels that people will always find a way to cheat, so she does not get hung up on authentication issues:

I'm not an authentication person—I mean this in “how do we know this person is the person in the online environment—how do we know? How do I know that you're you sitting the classroom?” That's not one of my fears. Authenticity—people will always lie. What am I going to do about it? (P)

Finally, the idea of **having a voice** in the tool/technology decision-making process came up in a few of the interviews as well. Though in each interview it expressed itself differently, the overarching theme was ensuring that the instructional design voice is heard in the tool selection and administration of the learning environment.

In the case of Pat, she explained that she currently does have a voice and her technological needs are heard, and supported:

... having a voice on institutional strategy, which is very difficult to get in a Higher Ed environment. I do have a voice so that bringing in any new tools or new technologies isn't a struggle. (P)

Scott discussed the struggle he has with technology as both a resource and planning issue. For him, he would rather see flexibility with tools and not see them as an enterprise-level purchase and implementation. Being a part of this decision-making process and having a strong voice in this area are important to him:

... the challenge is that on one hand, the way IT thinks is in price. How much does this cost us, for how long? So they have to sort of plan out for that. But at the same time they want to also to have things happen really quick. They have everyone at the institution saying but this is technology, things can happen quickly. So they're spending a lot of money for things ... I feel like the programs should be more data-driven and the tools should be more rapid development. Like we have a new program, then the tools should

just come in and do that. The problem is that IT has much better understanding of the financial side of it and not really the development side. (S)

So, for me the review of the of tool costs is that with IT, it would be ... when I budget this, do I budget out for an Articulate developer, with also purchasing the technology, and the dedicated system? Do I, for video, use the internal capacity that we currently have (which is not strong), or do I go outside and hire a video person who shoots video and edits. Are these things even relevant to what we want to develop? (S)

Jake sees technology challenges pragmatically, essentially as a service challenge, and one that impacts the ability to deliver a quality learning experience. With strong oversight and responsibility in terms of the technology, the issues that Jake articulated were more centered on accountability and making sure that while faculty have a voice in the tools they want to use, he too has one:

Some of it is user experience perspective, some of it is intellectual property quality control issue, and some of it is branded user experience, we want to make sure students have a comfortable [Institution Name] experience. Because these instructors aren't always, and then again, some of them absolutely are, and maybe the majority are perfectly well, qualified to make the decision of using that tool or that tool ... that's all fine and good but we want also to learn if it is good, and if it isn't we want to be able to control for it. It's tricky—a tricky business—I tell everyone, there's no yes or no in any realm, it's all negotiation. That's what makes it fun. (J)

Conclusion

In this chapter, the quantitative survey data supplied important demographic information along with information about teaching and learning experiences. The survey data also provided a breadth of information about what participants thought were effective approaches to teaching and learning, the types of tools they felt were pedagogically effective, and the various aspects they felt did or did not have an impact on their decision making. The data collected from the 30 participants helped to open a window into the factors that impact the selection of online learning platforms and tools. Analyzing these data by contrasting them against satisfaction and experience focuses on

possible details and nuances in the findings that can reveal patterns, trends, and anomalies.

The follow-up interviews with the five selected participants provided qualitative descriptive information, which affords a different view of the subject. These data can help contextualize and explain some of the findings in the quantitative data, as well as suggest other possibilities. The sequence of the interviews allowed for answers in the survey to inform the interview questions, giving the participants a chance to qualify and explain the reasoning behind their answers. The two data sets will now be considered together, providing a way to understand not only the survey data on the decision-making, but the environment in which these decisions are being made.

Chapter V

CONCLUSIONS, DISCUSSION, AND SUGGESTIONS FOR FUTURE RESEARCH

Introduction

The purpose of this study is to better understand the factors that influence leaders in higher education when they are selecting platforms and tools to support online learning. Through a mixed methods approach, the study employed online surveys and follow-up interviews to examine the influence and importance of certain factors that impact decision makers when selecting the tools and platforms necessary to support online programs in higher education.

The instructional frameworks of Bruns (2009) and McConnell (2006) provide a background in, and suggest approaches to, incorporating social and collaborative knowledge-building approaches into online education. These frameworks encompass new ways to conceptualize and utilize technology in supporting pedagogy for true learning online, and they also consider the needs of adult learners, the promises of recent technologies, and multiple approaches to organizing and supporting learners, and most importantly, go beyond the rehashing of in-person learning approaches in a new environment. The questions developed and used in this study were drawn from these frameworks, as well as the broader literature related to online learning, adult learners, social teaching and learning approaches, faculty readiness for online teaching, and current tools and trends.

With these topics in mind, the study's participants were surveyed on both external factors, such as the cost and ease of use of systems, as well as personal ones, like what role their own preferred approaches to teaching and learning play, and satisfaction with the tools they are currently using. During the analysis, the data were examined from several different perspectives, first by looking at results across the entire sample, and later by filtering and grouping results by variables like the participants' satisfaction with the tools, experience in teaching and learning online, and their professional background.

Before delving further into the discussion, the following is a review of the research questions that guided this inquiry:

- How does the decision maker's perspective on teaching and learning approaches impact how online tools and platforms are selected?
- How do the decision makers weigh budgetary, technical, pedagogical, and user support concerns when selecting online tools and platforms?
- What online tools (i.e., blogs, wikis, discussion forums) and course management systems (i.e., Blackboard, Moodle, Sakai) are the decision makers in the online education programs of higher education implementing at their institutions and why?
- Do the tools and platforms that institutions have selected adequately support the decision makers' desired learning environments?

Discussion

In a chapter from the ebook, *Theory and Practice of Online Education*, Alan Davis, Paul Little, and Brian Stewart (2008) wrote about the complexity of setting up an online learning environment:

Building the infrastructure for online learning has many interconnected components and many factors must be considered, so it is hard to provide a straightforward checklist or recipe to follow. Distance education has

provided an understanding of how the entire system of course design, development, and delivery occurs, and how these link to related learner services and other components, all of which are vital aspects of ensuring effectiveness and quality. (p. 122)

It was the notion that such a checklist or recipe did not exist that prompted the question of just how the tools and platforms are being used in online learning actually selected, which in turn led to wanting to better understand what influences the choices of the decision makers.

While this study could be seen as a jumping off point into many more specific questions, the results from this study help to underscore that, while decisions makers in the online learning field believe the general approach to good online learning should embrace social and collaborative teaching and learning methods, such as the ones championed by educators like Bruns and McConnell, there is still very little agreement on how to achieve and support such an environment. In terms of current tool selection, the findings would appear to suggest a possible mismatch between the desired learning environment and the tools being selected. While the results are drawn from only a small fraction of the many institutions involved in online education, there still seemed to be a strong attraction to the tools that are simpler to implement, easy for faculty to use, and that relied on more individualistic approaches to learning.

The research question of personal satisfaction with the tools seemed to have little bearing on the selection of tools. Some of the people who reported being satisfied with the tools revealed more nuanced feelings of accepting the tools while acknowledging their limitations. Others who had reported dissatisfaction actually did not universally dislike the tools, but rather wanted much more from them. All the interviewees had similar visions of what the tools could look like and do. A factor that appeared to have an impact on tool selection was *experience* with online teaching, learning, and course development.

At the institutional level, success appears to have been found with different governing approaches, which emerged as an important theme in the findings but was not a top consideration when starting the study. What was found was that in some cases institutions have begun approaching tool adoption and implementation via governance and instructional structure. The governance structures often come from self-assessments and reviews across technical and academic areas and seem to have placed the institutions that have undertaken them into stronger positions to evaluate and purchase tools to support their online teaching efforts.

Though the original intent of this study was focused on what influences the selection of the online tools and platforms being implemented in online programs, in seeking these answers, a much larger picture formed, and it is one where the tools themselves are only part of the story.

The following is an examination of each of the guiding research questions in light of the 30 survey participants and 5 interview subjects of the study.

Question 1

How does the administrators' perspective on teaching and learning approaches impact how online tools and platforms are selected?

All 30 participants in the study generally indicated a preference toward constructivist and social learning approaches. For a quick recap, a set of teaching and learning approaches were presented for the participants to assign a level of effectiveness; the choices participants had with were *case-based*, *client-based*, *discussion-based*, *problem-based*, *project-based*, *self-paced*, *lecture based*, and *other*. Among all of the respondents, it was generally believed that *problem-based*, *project-based*, and *case-based* learning were either very effective or moderately effective, and *lecture-based* the least effective.

However, when looking a bit deeper into this very broad assessment, a more nuanced assessment seems necessary. By looking at the teaching and learning experiences that participants have had both *online* and *in-person*, differences begin to emerge that suggest that the question is not so much “how does the administrators’ perspective on teaching and learning approaches impact how online tools and platforms are selected?” but rather “what shapes the administrators perspective on teaching and learning approaches and, in turn, how does this impact tool and platform selection?”

This rephrasing is helpful, as it seems that with all reported best approaches to teaching and learning being similar, another way to look at this is by assuming that tools will be purchased to meet the needs of a teaching and learning activities, but that something helps inform the preferred approaches to teaching and learning.

This is where *experience* with online teaching and learning may play a role. It seems that all participants express both a preference for *project-based* teaching and learning approaches, and for those *with* online teaching experience, it is followed by *problem-based* and *case-based*, and then by *discussion-based* approaches. For participants *without* online teaching experience, the ratings for *case-based* and *problem-based* are similar, but there is a drop in the reported effectiveness of *discussion-based* and *project-based* approaches.

Looking at the same question but from the perspective of who has taken an online class or not, the following emerges: those who *have* taken online courses still place *case-based*, *problem-based*, and *project-based* at the top; however, there is a slight increase in the ranking of *discussion-based* and, to a degree, *lecture-based* approaches. For those who reported *not having* taken an online class, there is strong skew toward one of the choices. *Client-*, *problem-*, and *project-based* are all rated as “very,” and *discussion-based* has 3 “very” and 1 “somewhat.”

The results of preferred *in-person* teaching learning approaches, in comparison to *online* teaching, is interesting as well. *Lecture-based* and *discussion-based* approaches

rise in the effectiveness ratings, while *problem-based* and *project-based* approaches skew down toward “somewhat effective” and “not effective.”

Looking back at the literature, Bates (2005) discussed how technology choices should be driven by the needs of the learner and not the novelty of the technology. Is it possible that participants with experience in online teaching and learning are attracted to pedagogically tried and true practices such as discussion boards, and those who do not have experience are attracted to flashier approaches? This finding would seem to be the case when looking at participants with online teaching experience, where there is an uptick in the reported effectiveness of *discussion-based* and even *lecture-based*. It also holds true with people who have taken online courses. However, this does not seem to be the case for the four people who haven't taken an online course. In their cases, the choice was more unanimous and thus perhaps a little less critical.

In these cases, what the data seem to reveal is that *experience* with teaching online, and, to a lesser degree, taking online courses, is an important factor in terms of forming the teaching and learning approaches that seem more or less effective. *Experience* is a significant driver in which teaching and learning approach is considered effective. One thought is that perhaps with a bit of a distance from direct teaching with the technology, the imagination may run bit more to the adventurous side, not being encumbered by more practical implications with the set-up involved.

Recall that when looking at in-person choices, *lecture* and *discussion* are rated higher than in online teaching. Is it that people have settled in to how they like to approach teaching? Lectures and discussions are quite ubiquitous and manageable in in-person teaching, but online, does it seem like it takes a lot more effort to hold a lecture and facilitate a discussion, or does it seem arcane? If so, are *case-based* and *problem-based* better approaches in online teaching and learning? For example, the drop in the rate of *very effective* for *discussion-based* and *project-based* seems to suggest that those who have not taught online are less convinced of those methods' effectiveness.

Turning to the interviews, Pat had a strong statement on how a leadership vacuum had an impact on the development of an online learning environment. From this perspective, tool selection has not been driven by a preferred teaching and learning approach, but rather by a leadership gap:

The folks that have been doing this there just rush and run and do something. They have not taken time to think before-hand and because—I think—there is no director of academic technologies, there has not been someone to say, “Whoa, wait a minute.” (P)

Scott supports the notion of experience being a driving factor in shaping attitudes toward teaching and learning approaches, but that the tools themselves have little bearing on their use and outcomes:

Faculty start saying, “I get so much more out of my students than when I had them face to face.” What they are really talking about is that they are able to facilitate a discussion, get them to think deeper, and produce more. (S)

Teaching online is like you are a first-time teacher again, and if you can't take the time to really explore these things and understand how students can be successful in these spaces and doing these things and doing them online, then you'll never be a good online teacher. And the tools have very little to do in relation to the overall thing. (S)

Jake also discussed experience from a technical standpoint, rather than a pedagogical one:

... the instructors aren't always possessed, in every case, of the expertise to select a preferred tool ... they don't all have the kind of experience where they know how to work with them in conjunction with our system (J)

While there does not appear to be a strong connection between the preferred teaching and learning approach to tool choice, a closer look at the results does suggest the possibility of an indirect one. It seems that factors such as the recommendation by faculty and peers, and cost have a stronger bearing on the tool selection than preferred teaching and learning approach.

Overall, it seems that *experience* with online teaching and, to a lesser degree, learning has a more of an impact on the types of approaches that are seen as most effective. It is through experience with online teaching, and to some degree taking online courses, that a leader in this space may develop stronger affinity toward certain teaching and learning approaches, and then funnel these choices into decisions of the tools to bring into their programs.

Question 2

How do the administrators weigh budgetary, technical, pedagogical, and user support concerns when selecting online tools and platforms?

In the survey, participants were asked to go through a list of factors that could possibly influence tool selection, ranging from the pedagogical to pragmatic. First, participants were asked to rank all the factors listed, and next, to select just their top three (see Figure 17).

When looking at the responses for the top three factors for all participants, *recommendation from faculty* came in the top spot. *Research studies* came in second, and *ease of use for faculty* came in third. *Alignment with the institution's preferred learning approaches* came in tied with *cost* in fourth place. *Personal approach to teaching and learning* was not a top three factor at all.

When looking at the general rankings, *personal approach* toward learning crept into the picture, and both *faculty* and *student ease of use* jumped to the top spot. *Data security* made a strong showing, as did the *integrate-ability* of the tools.

The result of these rankings would seem to indicate that faculty have a strong influence on which tools are chosen, which again can be linked back to the idea that pedagogy is more of a driving factor than administrative needs. It also seems that *usability* is a top consideration, and *cost* is a factor that cannot be excluded when all

things are equal. However, when the participants were pressed to prioritize, *faculty* considerations moved to the top.

Implications for this finding would seem to have bearing on many aspects of tool choice, including support and training efforts. As discussed earlier, if the administrator wants to offer more intensive, produsage-oriented activities, both faculty and students will need to be trained so that there is an alignment with ease of use. According to the surveys, almost all of the participants indicated that their institutions offer some level of training and support, though one said they offered very little. (This would be an interesting area of study for faculty, asking what type and the effectiveness of the training they receive, and what expectations they may have.) Additionally, with *data security* being high on the list, the vetting of tools and reviewing their terms of use, privacy, and supportability become extremely important. Take, for example, Jake's strict stance:

One of the things that we discovered too is that a lot of the [external] tools that instructors wanted to use are capturing information about the students, either forcing them to volunteer or forcing them to hand it over to the instructor who then passes it on to a third party. We take a very very very conservative approach to FERPA, HIPPA and everything. And rightly so, we should always be constrictive and wary and keep the student information as private as possible. (J)

The solution here is one that Jake and Brad both discussed: an official process in which tools are evaluated, and if passing certain heuristics, they become part of the supported suite of tools, which positions it as a policy and governance issue.

Since *ease of integration* and *faculty recommendation* are similarly valued and both high on the list, it is possible to look at these in terms of a "holy grail" for educational technology: the ability to mix and match best components into a cohesive system. This is a theme that came up across all of the interviews and describes the nexus between being able to offer a sleek usable environment and one that is open to accommodating the tool needs of faculty and administrative needs of the college. This

surfaced, for example, in Brad’s interview, where the term “ecosystem” was used to describe the ideal environment:

What I see on [the] horizon, ... is a much more flexible architecture where we have really a Learning Management *ecosystem* and that’s going to include some of those basic administrative tools that are going to link you in and have that kind of robust security and roles and responsibilities that you need. Then you also have an ability to clip on, and add in to that flexible system, tools that may be needed by certain programs or disciplines or new approaches so that people can share video, and tag it, or use text messages, or people can annotate information and generally speaking those needs are not going to be met by one tool. (B)

It appeared again with Kate:

I think there are some great tools out there, but again it depends on what you are trying to accomplish. The best tools are the ones play really nice in other platforms and that can be integrated seamlessly that can sit there and do their part without any users understanding their part in the *ecosystem*. (K)

And in spirit with Jake:

We’ve been talking for a while about using technology in new ways to teach and we’ve got new ideas that involve newer technologies and we’ll be able to do good stuff there. I mean ultimately, I think that whole lot of things like LMSs and a lot of the software is just a front end on a database anyway. So if we can keep the database part but maybe make the interface more in line with synchronous content, while also gaining the advantages of asynchrony and distributed content, I’d be excited for that to happen. (J)

Brad, Kate, and Jake are the three interviewees who also had the most robust and developed governance structures in place for their online programs, and it seems like with the stability of governance and curriculum, the next stage in thinking is how optimal can the environment be made, and what it would take to get there.

Interestingly, one of the factors that came in last across all participants is impact of *recommendation by sales people*. This makes sense, as most leaders in this area would turn to faculty, peers, research, and even personal observation before being “sold” on a product. However, as one survey taker noted, faculty often bring in their own tools after being influenced by a sales representative.

When looking at only the participants who reported being *satisfied* with the tools (60% of who took the survey), a slightly different picture appears. *Recommendation from faculty* still came in first, followed by a tie between *recommendation from peers*, *cost*, and *ease of use for faculty*. In third, there was a tie between *students' ease of use* and *research studies*, whereas for the *dissatisfied* participants, *recommendation from research studies* was in the top place, and then tied in second place were *recommendation from faculty* and *institutions approach*. Finally, in third place were *faculty ease of use* and *cost*.

Generally, *recommendation from faculty* came in the top spot for all, but when thinking about the difference between *satisfaction* and *dissatisfaction* with the tools, it is interesting to see how *recommendation from research* (dissatisfied) switched places with *recommendation from faculty* (satisfied).

Is there any logic in saying that faculty recommendations lead to a higher level of satisfaction on the administrator's part? Is it possible that satisfying the faculty leads to a high level of *satisfaction* overall? Similarly, is there any sense in thinking that doing more research, and knowing more, leads to a higher level of expectations, and thus potential *dissatisfaction* with the tools? It is hard to say, but in both cases, *cost* rose up to a higher spot as well, indicating the need for a pragmatic choice when determining which factors are most important.

To bring this back to the question at hand, it would seem that the weighing of factors is based on a delicate balance between practical matters and faculty needs, and is indirectly pedagogically driven. As schools decide what types of programs they want to support, whether their model is based on scalability, replicability, exploration, or somewhere in between, the next move is into governance structures and a more established process for onboarding and supporting tools.

Question 3

What online tools (i.e., blogs, wikis, discussion forums) and course management systems (i.e., Blackboard, Moodle, Sakai) are the administrators of online education programs in higher education implementing at their institutions and why?

Figure 14 presented the options that were listed in the survey, for which participants checked off the platforms and tools they use in their program. In addition, participants were given a chance to fill in a text field with other tools that had not been listed.

The results for the selection list showed that Google Apps is a very popular toolset, reported by 22 participants to currently be in use. It is a free tool and useful for creation and sharing of documents, spreadsheets, presentations, and websites. For LMS platforms, Blackboard and Canvass were shown to have a high use rate, and to a lesser extent, Sakai and Moodle. Collaborative conferencing software is also well represented, with Adobe Connect surpassing Google Hangout, Big Blue Button, and Black Board Collaborate. YouTube and Wordpress, for viewing video and blogging, respectively, seem to be highly popular tools. Some other tools like Prezi, Slideshare, Voice Thread, among others, barely registered on the charts.

However, there is broad range of tools available, and naming each one seems to be a slightly futile task, as tools change and new ones are created. Rather than which exact tool is used, the more appropriate question would seem to be, “What is the pedagogical intent of the instructor and how can it be met?” Pat’s observation about ignoring tool specificity serves well to underscore this point:

I can’t tell you how many times I’ve hammered a nail into the wall, using a shoe—that’s the analogy that I use all the time. I will use any tool if it works. It may not be the tool that was created for that purpose, but I’ll use it for something. (P)

This idea that tools are less important than the environment that is created for using them in came across in several interviews. See Scott’s comments below, as he speaks

specifically to the point of his efforts to ensure that faculty feel supported and are happy with the tools. In general, he sees tools more as a set of options to select from:

I think you need to have access to open tools for the faculty where they can go and experiment and not feel like that they have run off the range. That's what I love about Google Apps—it really gives you a way to say—instead when people like I just found this new tool let's buy it—you can say, “Oh, sorry, well you didn't like WebEx, would Google Hangouts help you? Maybe you would just like to try a Skype with this? Maybe that would be all you need.” (S)

Looking at the LMS, which is in fact often a collection of tools, there is Jake, who expressed that he was satisfied with the learning environment at his school, but acknowledged that platforms, too, have their limitations and a perfect online environment is probably not a reasonable expectation:

I actually think that there are some big problems with the LMS and with the way some things are currently handled. So in that sense I'm a little dissatisfied, but our tools, in comparison to what is available in the world, I'm pretty happy with what we've got. (J)

It was Kate who went further in suggesting that tools, specifically LMS, can be also be a “trap” for an institution. Scott's and Kate's comments suggest that careful consideration should be made before going into tool selection:

What I think has ended up happening in this space is that everyone searches for an off-the-shelf solution and then once they really get into it they find out that it doesn't really work all that well, because it was not ever geared to what their functional requirements were. (K)

Rather than trying to see specific tools, it seems more useful to look at tools as “types.” In the survey, participants were asked about the perceived effectiveness of tools, not by specific names but rather tool categories. The results placed *videos*, *simulations*, and *discussion boards* at the top. *Blogs* and *document creation* and were tied in fourth place, followed by *social networking* and *wikis*. At the bottom, people placed *podcasting*, *drawing*, *RSS Feeds*, and *social bookmarking* (see Figure 15 for a full list of the tools mentioned in this study).

What stands out about the results of this ranking is that, when considering teaching and learning approaches, *video*, which does not typically require learner interaction, was considered more effective than collaborative knowledge building tools like *wikis* or *social bookmarking*. It seems that that the top ranked tools are on the simpler side to use, like *discussion boards*, *videos*, *simulations* (the assumption here is that the simulation is purchased or readily available software), and ranked lower were the tools that require a good deal of user input to be effective, like *wikis* and *social bookmarking*.

Recalling Bruns's (2009) ideas of a user-content creation approach to teaching and learning, many of the tools ranked lowest in the survey are the tools that would be involved in faithfully following his "produsage" approach, which is predicated on strong social and constructivist learning underpinnings. For his approach, it would seem that curating a project like a wiki or developing podcasts are activities that would be high on the list, as these activities require a good deal of collaboration, creativity, communication, and active contribution to be effective. While not a definitive result, it could be seen as an indicator that more could be done to help make online learning more engaging through the use of these more demanding tools.

Additionally, in Table 10 there is a full list of other tools that were provided by the survey participants, many of which were unknown to the researcher at the time. Also, it is difficult to say from this dataset alone how faculty are using these tools, but there is the possibility that tools that require more user control or are more difficult to use may not be perceived as effective.

An alternative view of the ranking of tool effectiveness could be that video and discussion boards are ubiquitous and quite well-established tools. It could be that once past this baseline, there are more options for supporting social learning activities and the type of tool becomes a much more personal, and possibly experience-based, choice.

Role of pedagogy. From the interviews, there is a general agreement that pedagogy should be the driving factor in tool selection. For example, as Scott discussed his

experiences in online education, he explained that students want strong pedagogy, not cumbersome tools:

My concern isn't the overall online experience in terms of is it the most beautiful, does it have all this branding to it, is it the best experience online. Because at the end of the day what the students want is the experience, and they really want strong transformative pedagogy. (S)

And also what faculty should ultimately be concerned with:

In our meeting yesterday we started talking about "how do I do this," and the first focus is that they want to talk about the technology but then it starts to have to do more with the pedagogy. (S)

Pat underscored these statements with a discussion how the tool is a vehicle for getting something done, for driving pedagogy:

Faculty who come in may need anything ... for me technology has always been the tool that we slap on top of what were trying to get done. So I've set up the environment that I'm working in to be that way. (P)

Outside tools. The survey also asked decision makers how they felt about faculty who bring in tools outside the known and supported online toolset. Slightly over half of the participants indicated that they felt faculty could bring in any tool they wish, as long as they use the college's LMS. Twenty percent of the participants indicated that faculty must use the tools that are supported and available, and the remaining percentage was comprised of participants either more lenient who thought faculty could use any tool they wish, or they were undecided. This is an area ripe for further exploration, and it was followed up in the interviews. It seems that there is an a bit of division at this point between creating an environment that can be easily supported, data-secured, and quality-controlled versus one that is entirely open for exploration, trial, and error.

For example, Kate's college offers a set curriculum and a suite of supported tools. Kate is also in the small percentage of respondents who feel that faculty should be using provided tools only. For the scale and reach of the school, this is a pragmatic approach

and probably the only way it could operate. With this scalable, replicable, but restrictive model come options that other schools may not have:

When you have a traditional university, you have tenured faculty, and each faculty sort of designing their own course. We can't do that. If we did that we'd be teaching statistics 500 different ways, and with 100 different textbooks, so we actually have a standardized curriculum. So, that in turn allows us to make deliberate choices of instructional design at scale and technology at scale. (K)

It would seem that speaking with Kate, that having the curriculum and teaching approach established, the challenge moves onto selecting the right technology:

I think I spend most of my time thinking about the technology and how we can get it to do what we need it to do over anything else. The curriculum, we have subject matter experts and we know good instructional design, and we have the content. It's really the technology that's often the challenge. (K)

Scott and Pat discussed the importance of having a space to experiment. Often using the concept of "piloting," Pat spoke about a center for technology that was a spot for faculty to experiment and try out tools, and at then at some point running a course using the new technology and later determining its success. Scott spoke about how it is important for faculty to drive the course and, in a sense, choose the tools that work best for them:

Even if it's not faculty-driven, it should be faculty-guided, there should be somebody there who is engaged with the institution and understands the institutional mission, and not just institutional mission, but departmental and programmatic mission that at the end of the day they are not just cookie cutter programs out. (S)

What seems promising is a middle ground that Jake and Brad have separately staked out. Brad discussed how his institution established a yearlong project during which they canvassed the university and came up with a representative set of tools in use. They then tested and learned them, so that they could be supported and integrated properly, from an IT standpoint, into a larger, flexible environment. In Brad's words:

That is what we are all looking for—balance, in how to sustain a set of services that are flexible from an architectural stand point, secure and

reliable from a data standpoint, and still allow for some innovation. For us, it's building that architecture that you can add things in and take things out as they are needed. (B)

Jake discussed the need for the support team to know the tools that are being used, as they are the ones on the front-line in supporting the users, and also wants to ensure that software is adhering to best data security and privacy standards. He also spoke to how his division works with others in a systemized manner to vet, select, and implement tools (or not) that have been suggested:

Sometimes people have an out of pocket solution that needs to be evaluated in relation to a particular class of software. For example, telecommunications, we already know what we need to know about WebEx and Adobe and Skype, there's the whole lot. We don't have to think too hard about those things, but sometimes unique challenges come forward and we have to spend a little bit more time evaluating those, and depending if it's within our domain, evaluating it in-house here. If it's institutional, then we participate in the committee through the IT department. (J)

The least structured environment seems to be the one that Scott described. With multiple LMS, faculty are allowed to bring in any tool they wish, and following a very strong faculty driven model. The risks and rewards may balance out, as the college is one that appears to encourage exploration and discovery on one's own, and the risk is classes or technology being implemented less coherently.

As the factors of *security*, *cost*, and *usability* come into play, some sage advice comes from Kate in the form of describing how her college is now rethinking its LMS strategy:

We're really starting off with functional requirements. We looked in the past and we said we need an LMS, OK let's go look at LMSs, OK we saw there three, I like that one better, let's go with that. Now what we're trying to do is determine what are they key things that we need to do. (K)

Looping back to the "why" part of the question, it seems that if all the participants in general feel that *project-based*, *problem-based*, and *case-based* approaches are the most effective ways to teach and learn online, then these should be the most fitting criteria over what seem to be ones that are easy for faculty and students to use. This

would also support the types of learning that Bruns (2009) encourages with the “produsage”-oriented approach to learning. Of course, this ideal is tempered by finding the right balance among cost, security and usability of the tools.

Question 4

Do the tools and platforms that institutions have selected adequately support the administrators' desired learning environments?

In the survey, two questions asked directly about satisfaction with the tools that were currently being used at institutions. In the first question, participants were asked if they were either *satisfied* or *dissatisfied* with the online tools and platforms. The question asked: “Considering your teaching and learning preferences, do the systems and tools that you currently offer, support your institution’s online learning environment to your satisfaction?” In the second question, the reference to personal learning preference was taken out of the question, and the wording was changed to “How satisfied are you with the online learning tools currently being used at your institution?” with the answer choices a range from *very satisfied* to *very dissatisfied*.

Across all respondents, 60% said that they were satisfied, the others not. In the second question, of the 18 *satisfied* participants, 3 reported being *very satisfied*, 14 reported to be *satisfied*, and 1 was *neutral*. Of the 12 *dissatisfied participants*, 2 reported to be *satisfied*, 4 *neutral*, 4 *dissatisfied*, and 2 *very dissatisfied*.

In order to explore this question, the survey findings were split into “satisfied” and “dissatisfied” groups based on the first question for analysis and comparison. This was then examined along with a question about the roles participants had in the selection process. The choices were *research*, *evaluate*, *recommend*, *purchase*, *implement*, *train*, *provide instructional design*, *provide technical support*, and *other*.

One observation that came out of this analysis was that, while it did not seem to matter if participants had been integral in *recommending* the tools, there seemed to be a

possible connection with the number of participants who were *dissatisfied* with the tools and who also *implemented* them. In the first case, 11 of the 18 *satisfied* participants had *implemented* the tools, and 10 of the 12 *dissatisfied* participants had *implemented* the tools. Another observation is that between people who indicated that they had taught an online class (n=22), half were satisfied with the tools, while of the participants who had not taught online (n=8), seven were satisfied. In the question regarding degree of satisfaction, the same subjects reported to mostly be satisfied (75%, n=6) and neutral (25%, n=2). Essentially, it seems that once again *experience*, this time hands-on with the tools either implementing or teaching with them, seems to have influenced the satisfaction levels with the tools. Overall, the findings suggest that the less direct experience, the higher the *satisfaction* with the tools.

As mentioned earlier, four participants reported not to have ever taken an online course. Their level of *satisfaction* was evenly split between *neutral* and *satisfied*. Of the 26 who had taken an online course, 77% (n=20) reported to be *neutral* to *very satisfied* with the tools. In this case again, *experience* seems to play a role, whereas participants who have experienced online education as students have a wider range of feelings toward tools, as there was greater variability in their answers. The problem, though, with this observation is the very small size of the sample.

Back to the question at hand, it seems that the answer is, for the most part, people are generally satisfied with the tools, but actually it may be only to the extent of their level of awareness of the tools. Turning to the qualitative data, what is said qualifies some of the survey findings, while also adding a bit of ambiguity.

According to the results, 18 participants said that they were *satisfied*, and 12 said they were *dissatisfied* with the tools. However, even among the people who reported to be *satisfied*, in the follow-up interview, there was a more nuanced view expressed. Jake, who reported in the survey to be *satisfied*, said:

It's not like I'm going to say "Yay, this ... is awesome." I actually think that there are some big problems with the LMS and with the way some things are currently handled. So in that sense I'm a little dissatisfied, but our tools, in comparison to what is available in the world, I'm pretty happy with what we've got. (J)

Scott, who was also reported to be *satisfied* with the tools, said he liked his LMS situation because he had several to choose from. His satisfaction seemed to be rooted in the fact that there was a suite of options, and that he also has an agnostic view of learning tools in general. "I like my current LMS situation. Which is just that I can just cherry pick from different LMS, that's something I've never had before." However, he also tempered this with the following observation about the transient nature of the technology: "I've never been anywhere that we haven't changed LMS within three years."

Pat (who is not satisfied with the tools), echoed Scott's sentiments:

The LMS usually is given to you at the institution you are at. I've been through two or three new LMS integrations, but I wasn't a part of the selection committees. (P)

This question may be best served by Kate's view of the LMS and higher education. Her institution has an LMS in place, but there is now a very deliberate process in place to find a replacement that is better suited to the needs:

I think as an institution we fell into the trap that almost every institution falls into when they are going online—and maybe it's not fair to call it a trap but you sort of go "OK, I'm going online, I need an LMS, and there is a thing called a CMS that someone that some said once, I think I must need that too." And you have vendors lining up, saying "Oh you know Blackboard can do that for you, or whatever ... Canvass ... etc." (K)

This ends up serving the perceived need to have certain tools, but as Kate continued:

What I think has ended up happening in this space is that everyone searches for an off-the-shelf solution and then once they really get into it they find out that it doesn't really work all that well, because it was not ever geared to what their functional requirements were. (K)

Brad, whose institution has gone through a self-assessment and has settled on a particular LMS, echoed this type of deliberate and thoughtful needs assessment approach:

We worked this year with Gartner on an external review and also some interests groups both in [city] and [city] to try to understand some of the LMS of note, this year we put together a rubric of evaluation that Gartner helped validate and review and what their results suggest are that there are minimal differences between some of the core LMS administrative systems, the systems that connect to your student system and help you do grade books and rosters and what we call add/drops and stops, those elements that extend to grade books, basic quizzing functionality, lessons, tools. (B)

The goal for Brad is a solid but flexible architecture:

That is what we are all looking for—balance in how to sustain a set of services that are flexible from an architectural stand point, secure and reliable from a data standpoint, and still allow for some innovation. For us, it's building that architecture that you can add things in and take things out as they are needed. (B)

This is, in fact, a goal shared by all of the interviewees. Everyone is seeking a tool set that is flexible, can be mixed and matched, and supported in an integrated manner. And while many people are satisfied with the toolset they have, it seems that true satisfaction may be tempered by the search for the right balance between innovation and integration. In fact, the dream of the perfect toolset was said well by Scott, who would like to see the tools to be so transparent that students only see the learning:

My dream environment would be an institution that would be flexible enough to bring in technologies as they become relevant and also focused enough to understand that the online program needs to have a certain experience to it. That experience can be pedagogical, but I think any student coming into it—I want to remove the technology burden on the students so they notice how strong the pedagogy is. (S)

Conclusion

Overall, the survey data suggested that there really is not much debate on what decision makers say are the best approaches to teaching and learning in online learning. Overwhelmingly, social and learner-centered activities were considered the more desirable approaches. In addition, most participants also indicated that faculty at their institutions receive some sort of training with the tools and online teaching approaches.

However, what the survey also seemed to reveal was that the tools the participants indicated as being most effective were the ones that require less set up, less organization, and less activity on the part of the learners, for example, this can be seen in that *ease of use* topped the list as the most important factor in tool selection. Finally, from the discussions with the select set of participants, it seems that the schools with the most mature online programs were the ones that had embraced some sort of governance model to help guide institutional online learning efforts.

The creation of a model in which tools can be thoughtfully evaluated, selected, implemented, and supported provides a path to tool selection that makes for more holistic and quality-controlled experience. During the interviews, the discussion on tools typically turned toward assessing the institution's needs and then building (or rebuilding) from that point. In a sense, it is leadership and organizational issues that seem to present the largest obstacle—and solution—to tool selection.

Again, Davis et al. (2008): “Without effective structures and processes, the selection, deployment, and ongoing performance of an online learning system will prove challenging, and perhaps unsuccessful” (p. 122). Nine years on, this still holds true, and something that the study reinforces is that it is not the tools that matter, but rather, as in the words of one of the participants, it is a continuum in which a cycle of self-reflection and critical decision-making leads to the environment that is desired, and that then makes it easier to decide upon the tools, offer the trainings, and support an overall level of quality control.

For example, in Scott's case, indeterminate governance and open-ended institutional goals have ended up creating a more exploratory, but less consistent, approach that is literally full of options in terms of LMS and tools. On the flip side, there is Kate's institution, where a top-down professional instructional model has provided consistency and scale that can only be achieved through a very focused model. In between, we met Jake and Brad, who both have schools that have achieved some

equilibrium in terms of tools and approaches, based on a strong governance structure, and Pat, whose school is going through a leadership change and whose future model is uncertain.

As learned from the survey, most participants reported that the driving factors for tools were *student ease of use*, *faculty ease of use*, and *security*. However, from some of the interviews, it would seem that a tool that fits the pedagogical job seems to be the more practical factor, whose intake is guided by the institution's processes for the intake of new tools. In some cases, there is less administrative overhead and a more open experimental approach, and in other cases, there is more oversight and an institutionalized process for evaluating and integrating tools.

Data, *support*, and *security issues* seem to be either an important concern or not a concern at all. In the cases where it is a concern, tool selection is impacted by how secure data are, how integrate-able tools are, where tools are hosted, how accounts are managed, and how data are shared. When this came up in the interviews, some people shrugged it off, while for others it set off alarm bells.

Experience with teaching and learning online emerged as a major factor in shaping the preferred approaches to teaching and learning, and indirectly, the tools. From the survey, it could be seen that decision makers with experience in teaching online were a little more conservative in the types of activities and tools they felt worked best, and also had a more diverse set of feelings in terms of *satisfaction* with the tools.

The issues explored in this study are, in a sense, inseparable, each one extending some influence on another, and all seem linked with leadership. The impact of leadership can be seen in the cases where institutional governance groups have been put in place to review technology and tool selection. In the cases where there was a less stable governing structure, either where the schools were still looking into how they wanted to offer online education or they were undergoing a major reorganization and there was less clarity within the leadership, the decision-making process also tended to be less defined.

In this study, none of the factors stand out as ones that directly impact personal satisfaction with the current tools. Perhaps, in the end, the tools themselves really just do not matter, or more specifically, not until after establishing the institution's vision and approach to online learning. From the conversations, it seems that a good baseline online teaching and learning environment is a combination of easy-to-use tools for faculty and students, system interoperability like a single interface for logging in ("single sign on"), the ability to offer support to teachers and learners, and healthy amount of faculty input. Finally, a governance structure that balances out IT needs with the pedagogical and administrative ones is a key element, as the schools that had clearly outlined these roles appeared to have an easier time working together to create an online learning environment.

Recommendations for Future Studies

The mixed methods approach used in this study proved to be an interesting way to understand the participants' decision-making processes. However, leaders of online learning are busy people. With multiple, competing demands on their time, participating in a survey and a 45-minute conversation can be difficult to arrange. That being said, it would be interesting to run this type of study with a larger sample. Perhaps slimming down the question set would help, for example, by focusing on one or two aspects like how experience with online teaching impacts perception of tools.

In revising this survey, separating the question, "Considering your teaching and learning preferences, do the systems and tools that you currently offer, support your institution's online learning environment to your satisfaction?" into "Do the systems and tools that you currently offer support your institution's online learning environment to your satisfaction?" and "Do teaching and learning approaches impact how satisfied you

are with the tools?” would be easier to analyze, as the concepts would be cleanly separated.

In this study, the focus has been solely on the administrator, yet at many times it seemed that getting the opinion of faculty and students would add another voice to the mix, which could help place findings into a larger context. Adapting this study to be done with faculty and students would provide two other important perspectives into the adoption of preferred tools and learning approaches, for example, asking faculty about which tools they like using and why, how they go about constructing classes, what type of assistance they need, and if they feel supported. For students, exploring how they feel about the tools being used, especially in contrast to the online tools that permeate their lives like social media, smartphone apps, the support they get, the activities that they like/dislike and feel are effective would be informative. Within these three groups, one would find a wealth of information that could help better inform and improve the setup of the teaching and learning environment for online programs.

Finally, it would be of interest to catalog and evaluate the different models of online learning to see if there is a suite of online platforms and tools best suited to a particular approach. While this study has begun exploring these models from an administrative perspective, this is an aspect that was not deeply considered in the initial development of the study.

Implications

Based on the conversations, and bolstered by the survey findings, possibly the most important step in selecting and implementing platforms and tools for an online learning program is assessing what type, scale, or model of a program makes the most sense for a university or college. It is beyond the scope of this study to go much further into the types of models, but just from the interviews, it is apparent that there exists a contrast between

a faculty-driven model and a top-down professional teaching model, with variations in between.

Thus, one recommendation is that, if possible, there should be an assessment, or evaluation, of what should online education at the institution involve, and if it is currently configured to meet this vision. There is no doubt that there are many ways to make this type of assessment, and it will most likely differ from school to school. Again, from the interviews, two large university systems, one private and the other public, did an assessment across all of its schools to agree upon a single LMS and come up with a way to support tools as they are brought into the environment. Another large public school already had a strong idea of how they should operate and built their online program to fit this approach. Two smaller schools, both private, seemed to be either about to enter this process or will soon be thinking about it.

A governance structure and policies can then be developed around a set of processes, procedures, and a governing board, which can help to regulate the adoption of technologies in a supportable and sustainable manner, and help bridge any gaps between the IT and academic divisions. In the cases of the schools that already have a governance model, a mixture of needs assessment and careful thinking about what is really needed seemed to help drive the adoption of tools and the LMS that fits best.

Support and training is also very important; as one interviewee noted, faculty are the last mile in delivering online education, and another interviewee explained how group support of learning technologies is an integral component in creating the overall online learning experience. Questions that emerge are how to best offer assistance to faculty and how to open up a process where tools can be selected that meet certain criteria. Experimenting is important, too, and the creation of centers that offer faculty the opportunities to test and explore tools can be a key development in this space.

According to the survey, the most influential factor in tool selection is faculty opinion, first in terms of ease of use of the tools, but also their overall input and

recommendations. An interesting find, too, is that, though participants indicated that sales representatives have little to no influence on them directly, a comment in the survey stated that faculty often bring in new tools to use because they are persuaded by sales people!

Coming full circle, though, the biggest overall influence on tool selection once again is leadership and the governance structure of a program. While the data collected here are hardly comprehensive, they do begin to suggest that the decision-making process is heading into a new phase. As online learning programs evolve, moving away from the exploration stage to a more stable and institutionalized one, the road to tool adoption becomes somewhat easier to navigate. In the case where there may not yet be such a comprehensive policy for tool selection, it is possible that emerging frameworks and decision-making tools can assist, or help support, the decision making.

To end with such an example, the *Courseware in Context* framework (2016) developed by a partnership of private educational foundations and a consortium active in the online education space is geared toward helping “time-starved administrators” with online learning tool selection. The website introduces the framework as one that “supports postsecondary decision-makers in effectively navigating the market of courseware solutions.”

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Appendix A

Online Survey and Informed Consent Form

Factors in Selecting, Implementing and Supporting Online Learning Tools in Higher Education

Thank you for taking time to participate in this survey. The goal of this study is to better understand the factors that influence the selection, implementation, and support of online learning management platforms and learning tools in higher education.

It is estimated that this survey will take less than a half hour to complete. An additional option to participate in a follow-up interview is asked at the end of survey.

The data is being collected confidentially and no identifying information will be used in the report. If you have any questions about the study, please feel free to contact me.

Thank you!

Paul Acquaro
Principal Investigator
pa117@tc.columbia.edu

INFORMED CONSENT FORM DESCRIPTION OF THE RESEARCH: You are invited to participate in a research study that examines how higher education institutions select the platforms and tools used to deliver and support online education. This study is meant to develop a more complete understanding of the challenges and opportunities that exist for the administrators of online learning programs. You will be asked to answer a set of questions in an online survey and then asked to participate in an optional one-on-one interview that will be audiotaped for transcription purposes and deleted after the study is over. The principal investigator, Paul Acquaro, will conduct the research for this study. The link to the survey was emailed to you and any follow up interview will be conducted at a venue of your choice or via telephone.

RISKS AND BENEFITS: The risks associated with this study are minimal and identical to those you can expect from any survey or personal interview. Questions will not be sensitive in nature and you may decline further participation or answering certain questions at any time. If you decide to terminate your participation, all data will be destroyed. If it is your wish, the researcher will also refrain from audio-taping the conversation. You will not benefit directly from participation. However, copies of the final study will be made available to interested participants.

PAYMENTS: There is no remuneration to study participants.

DATA STORAGE TO PROTECT CONFIDENTIALITY: Survey and interview data is being collected confidentially. Pseudonyms will be assigned to your data prior to you taking the online line survey to ensure that you and your institution's identifying information is masked.

TIME INVOLVEMENT: Participation in the survey will take approximately a half hour. If you opt-in to participate in a follow-up interview, the time total time commitment may be up to one and a half hours.

HOW WILL RESULTS BE USED: The results of the study will be used for Paul Acquaro's doctoral dissertation entitled "Factors and Best Practices in Selecting, Implementing and Supporting Online Learning Tools in Higher Education" and may potentially be presented at meetings and conferences. Data may additionally be published in journals, or articles, or used for educational purposes. Teachers College, Columbia University IRB Protocol #14-373 Download Protocol 14-373 Stamped Consent Form

By clicking to the next page you are agreeing to participate in this survey.

How many years have you been working with online learning (as a teacher and/or administrator) (Please enter a number)?

How many years have you been in a leadership role for online learning at your current institution (Please enter a number)?

Which best describes your position at your current institution?

- Manager
- Director
- Associate-Dean / Provost
- Vice-Dean / Provost
- Provost / Dean
- Vice-President
- President
- Other _____

Which best describes your professional background (please check all that apply)

- K-12 Educational Administration
- Teaching (Elementary and Secondary)
- Teaching (Post-Secondary)
- Higher Education Administration
- Higher Education Teaching
- Corporate Training
- Information Technology
- Development / Fund Raising
- Business
- Public Relations/Marketing/Advertising
- Military
- Other _____

What is your role in the selecting online learning tools for you institution? (Check all that apply)

- Research
- Evaluate
- Recommend
- Purchase
- Implement
- Train
- Provide Instructional Design
- Provide Technical Support
- Other _____

What is your gender?

- Male
 Female

What is your age? (in years, optional)

Have you ever participated in an online course as a student?

- Yes
 No

Answer If Have you ever participated in an online course as a student? Yes Is Selected

What online course format(s) best describe the types of courses participated in as a student? (Please check all that apply)

- Blended (in-person / online)
 Synchronous Online
 Asynchronous Online
 MOOC (Massive Online Open Course)
 Other _____

Have you taught an online course?

- Yes
 No

Answer If Have you taught an online course? Yes Is Selected

How many semesters of experience of online teaching do you have (enter a number)?

Answer If Have you taught an online course? Yes Is Selected

What online course format(s) best describe the courses you have taught? (Please check all that apply)

- Blended (in-person / online)
 Synchronous Online
 Asynchronous Online
 MOOC (Massive Online Open Course)
 Other _____

Have you developed an online course (either adapting an existing course to be delivered entirely online or developed a new course?)

- Yes
 No

Answer If Have you developed an online course (either adapting an existing course to be delivered entirely online or creating a new course from scratch?) Yes Is Selected

What online learning course formats best describe the courses you have developed?
(Please check all that apply)

- Blended (in-person / online)
- Synchronous Online
- Asynchronous Online
- MOOC (Massive Online Open Course)
- Other _____

Answer If Have you developed an online course (either adapting an existing course to be delivered entirely online or creating a new course from scratch?) Yes Is Selected

When you have developed courses, are they:

- Courses you have taught
- Courses for other faculty to teach
- Both courses I have taught and for other faculty to teach

In the next set of questions, you will be asked to respond to questions for both online and in-person teaching and learning. In these questions answers pertaining to online teaching and learning are on the left and in-person on the right.

Please rate the following teaching and learning approaches according to how effective you feel that they are for both online teaching and learning (left) and in-person teaching and learning (right):

Which of the following teaching and learning approaches have you utilized in developing online and in-person course(s)?

	Online Teaching/Learning	In-Person Teaching/Learning
	Check all that apply	Check all that apply
Case based learning	<input type="checkbox"/>	<input type="checkbox"/>
Client based learning	<input type="checkbox"/>	<input type="checkbox"/>
Discussion based learning	<input type="checkbox"/>	<input type="checkbox"/>
Lecture based learning	<input type="checkbox"/>	<input type="checkbox"/>
Problem based learning	<input type="checkbox"/>	<input type="checkbox"/>
Project based learning	<input type="checkbox"/>	<input type="checkbox"/>
Self-paced instruction	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

Does your institution recommend any of the following teaching and learning approaches in its online and in-person courses?

	Online Teaching/Learning	In-Person Teaching/Learning
	Check all that apply	Check all that apply
Case based learning	<input type="checkbox"/>	<input type="checkbox"/>
Client based learning	<input type="checkbox"/>	<input type="checkbox"/>
Discussion based learning	<input type="checkbox"/>	<input type="checkbox"/>
Lecture based learning	<input type="checkbox"/>	<input type="checkbox"/>
Problem based learning	<input type="checkbox"/>	<input type="checkbox"/>
Project based learning	<input type="checkbox"/>	<input type="checkbox"/>
Self-paced instruction	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

Answer If Have you developed an online course (either adapting an existing course to be delivered entirely online or creating a new course from scratch?) Yes Is Selected

When you have developed online courses, how much did your personal preference of teaching and learning approaches guide the course design?

- Not at all
- A little
- A lot
- Entirely

Answer If When you have developed courses, are they: Courses for other faculty to teach Is Selected Or When you have developed courses, are they: Both courses I have taught and for other faculty to teach Is Selected

When you have developed online course for use by other faculty, how much did the other faculty member(s) preferred approach to teaching guide the course design?

- Not at all
- A little
- A lot
- Entirely

How many years has your institution been offering online courses? (Enter a number)

How many online courses are generally offered per semester?

Does you institution offer degree bearing online programs?

- Yes
- No

Which describes your higher education institute best (check all that apply):

- Community College
- Technical School
- Undergraduate
- Graduate
- Other _____

Which category fits your higher education institute:

- Public
- Private Non-Profit
- Private For-Profit

Where is your college located:

- Northeast
- Midwest
- South
- West

Which best describes your institute's campus setting:

- Rural
- Suburban
- Urban
- Multiple camus locations, mixed settings
- Other _____

Does your institution offer any certificates or degrees that are available exclusively online?

- Yes
- No

Are the same courses offered both online and in-person?

- Yes
- No

In which of the following formats are online courses offered at your institution? (check all that apply)

- Blended Blended (in-person / online)
- Synchronous online
- Asynchronous online
- MOOC (Massive Online Open Course)
- Other _____

Approximately how many faculty members at your institution teach online courses?
(Enter a number)

Are faculty required to teach online courses?

- Yes
- No

Answer If Are faculty required to teach online? Yes Is Selected

Are faculty provided an incentive to teach online?

- Yes
- No

Answer If Are faculty provided an incentive to teach online? Yes Is Selected

What is the incentive?

Approximately how many students do you have in your institution (number)?

Approximately what portion of your students are non-traditional students? (i.e. working adult students, commuter students)?

- Less than 10%
- Between 10% - 25%
- Between 25% - 50%
- Between 50% - 75%
- More than 75%
- Unknown

How would you rate the following stakeholder groups at the institution in terms of interest in online learning?

	None	Some	Moderate	Extreme	Unknown
Undergraduate Students	<input type="radio"/>				
Graduate Students	<input type="radio"/>				
Faculty	<input type="radio"/>				
Administration	<input type="radio"/>				
Governing Board	<input type="radio"/>				
Other	<input type="radio"/>				

Note: This study defines a Learning Management System (LMS) as an online learning platform like Blackboard or Moodle, and online learning tools as either features within an LMS (blogs, wikis, etc) or external to the LMS (like Google Apps, Wordpress, WikiMedia, etc). Question: Please list, as many as you can, the current set of LMS and learning tools that your institution currently offers to support online learning efforts:

Just to make sure we've captured all of the tools that your institution offers, please check off any of these common tools that you currently support but didn't include the previous list (it's okay if you list tools twice):

- Adobe Connect
- Alfresco
- Articulate
- Big Blue Button
- Blackboard
- Blackboard Collaborate
- Blackboard Learn
- Blogger
- Canvass
- Coursera
- Delicious
- Diigo
- EdX
- Epsilen
- Facebook
- Google Drive: Docs, Sheets, Slides, Draw
- Google Hangouts
- Google Sites
- iBooks
- iSpring
- iTunesU
- Mahara
- Moodle
- Ning
- Pinterest
- Prezi
- Sakai
- Siminars
- Skype
- Slideshare
- Tegrity
- Twitter
- Udacity
- Udutu
- Voice Thread
- WikiBooks
- WikiMedia
- WikiSpaces
- Wordpress
- Yammer
- YouTube
- YouTube Edu
- Other _____

How frequently do you implement new online tools to support your institutions online learning courses?

- Often (several times a year)
- Approximately every 1 - 2 Years
- Approximately every 2 - 3 Years
- Approximately every 3 - 4 Years
- Less often than every 4 years

Do you plan to replace your LMS, or any other major online learning tool, within the next 6 to 12 months?

- Yes
- No

Answer If Do you plan to replace your LMS, or any other major online learning tool, within the next 6 to 12... Yes Is Selected

Why will you be replacing your LMS within the next 6 to 12 months?

Please indicate your preference:

- The systems or tools are open source products
- The systems or tools are proprietary products
- Does not matter

When considering the adoption of tools, how important are the following factors?

	Not at all Important	Very Unimportant	Neither Important/ Unimportant	Very Important	Extremely Important
Recommendations from faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendations from students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendations from peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendations from literature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendations from sales representatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effectiveness based on academic research studies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effectiveness based on observation and personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not at all Important	Very Unimportant	Neither Important/ Unimportant	Very Important	Extremely Important
Fits your preferred approach to teaching and learning (i.e., case based, client based, problem based, lecture based, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fits your institution's preferred approach to teaching and learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easy to set up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to provide internal technical support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of external technical support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of integration with existing tools and platforms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to host the system or tool on external infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to host the system or tool on internal infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data security	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data storage formats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of use for faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of use for students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using the same list, rank the top 3 important factors that when considering the adoption of tools by putting a “1” next to your first priority, “2” for second, and “3” for third:

- _____ Recommendations from faculty
- _____ Recommendations from students
- _____ Recommendations from peers
- _____ Recommendations from literature
- _____ Recommendations from sales representatives
- _____ Effectiveness based on academic research studies
- _____ Effectiveness based on observation and personal use
- _____ Fits your preferred approach to teaching and learning
- _____ Fits your institution’s preferred approach to teaching and learning
- _____ Cost
- _____ Ease of set up
- _____ Ability to provide internal technical support
- _____ Availability of external technical support
- _____ Ease of integration with existing tools and platforms
- _____ Ability to host the system or tool on external infrastructure
- _____ Ability to host the system or tool on internal infrastructure
- _____ Data security
- _____ Data storage formats
- _____ Ease of use for faculty
- _____ Ease of use for students
- _____ Ease of training users

If there are there any factors that you feel are important that were not asked, please use this area to indicate what they are:

How do you rate the effectiveness of the following types of educational tools for online education?

	Not Effective	Somewhat Effective	Very Effective	Do not know
Blogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Concept mapping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussion boards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drawing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Email	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geographical mapping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Live chats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Podcasting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Photo sharing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RSS feeds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spreadsheets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social bookmarking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social networking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tagging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Videos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wikis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Word processing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How important is it that your online learning tools work on mobile technology?

- Not at all Important
- Very Unimportant
- Neither Important nor Unimportant
- Very Important
- Extremely Important

Are you aware of tools being used by instructors that differ from the ones that you currently offer and support?

- Yes
- No

Answer If Are you aware of tools being used by instructors that differ from the ones that you currently offer and support? Yes Is Selected

Do you know which tools they are using?

- Yes
- No

Answer If Are you aware of tools being used by instructors that differ from the ones that you currently offer and support? Yes Is Selected

Do you know why faculty are using tools outside what you currently offer and support?

Do you feel that faculty should be able to:

- Use any learning tools and platforms tool they wish
- Use only the learning tools and platforms that your institution provides
- Use any learning tools that they wish, but must use the institution's learning platform
- Undecided

Considering your teaching and learning preferences, do the systems and tools that you currently offer support your institution's online learning environment to your satisfaction?

- Yes
- No

How satisfied are you with the online learning tools currently being used at your institution?

- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very Dissatisfied

Answer If How satisfied are you with the online learning tools currently being used at your institution? Very Dissatisfied Is Selected Or How satisfied are you with the online learning tools currently being used at your institution? Dissatisfied Is Selected

You indicated you were very dissatisfied with the tools currently being used, why is that?

How do you support faculty who are teaching online? (check all that apply)

- Online professional development workshops/trainings
- In-person professional development workshops/trainings
- Faculty are encouraged seek out their own training
- No support provided
- Other _____

Answer If How do you support faculty who are teaching online? (check all that apply) In-person professional development workshops/trainings Is Selected And How do you support faculty who are teaching online? (check all that apply) Online professional development workshops/trainings Is Selected

What type of training do you offer your faculty? (check all that apply)

- General overview of the tools supported by the college (i.e. how to use the LMS)
- Specific technical training on the tools supported by the college (i.e. advanced workshops on using specific tools)
- Teaching strategies for online learning
- Course design and development strategies
- Student assessment strategies
- Other _____

Do you offer instructional design help to faculty to assist with development of online courses?

- Yes
- No

Does your institution regularly evaluate how faculty are using tools?

- Yes
- No

Answer If Does your institution regularly evaluate how faculty are using tools? Yes Is Selected

How do you evaluate how faculty are using tools?

If you would like to receive a copy of the report when it is complete, please enter an email address that a link can be sent to (Please be assured that your responses will still, and always, be treated confidentially).

Thank you for taking the time to participate in this survey. In order to gain the best understanding of the factors that impact online tool selection and implementation, I will be following up with some survey participants to conduct short interviews. Please indicate here if you would like to not be contacted.

- Yes, you may contact me.
- No, please do not contact me.

Answer If Thank you for taking the time to participate in this survey. In order to gain the best understand... Yes, you may contact me. Is Selected And If you would like to receive a copy of the report when it is complete, please enter an email you can be contacted at here: Text Response Is Empty

Please enter an email address that you can be contacted:

Answer If Thank you for taking the time to participate in this survey. In order to gain the best understand... Yes, you may contact me. Is Selected And If you would like to receive a copy of the report when it is complete, please enter an email you can be contacted at here: Text Response Is Not Empty

If you would like to be contacted at an email address different than than the one you entered to receive the report, please enter it here:

Appendix B

Interview Protocol

About the Administrator:

1. What is the promise of online learning for addressing systemic issues in Institutes of Higher Education (such as ... cost, personalized content, teachers as 'generalists' – skill gap, lack of reforms at reasonable cost)?*
2. Do you see any examples where this promise is being met? Please explain.
3. What do you consider to be the necessary elements for effective online learning?
4. What do you consider to be the necessary elements for effective online teaching?
5. What kind of teaching approach do you believe fosters online learning best?
6. How would you describe your teaching approach?
7. What are prerequisites of successful online learning?

About the Institution:

1. Can you give a brief history of your online program?
2. What are your institution's goals for online learning over the next five years?
3. What plans do you have for online learning at your institutions over the next 12 - 24 months?
 - Based on survey:
 - You indicated that your school is planning on offering an exclusively online degree-bearing program. Please elaborate?
 - You indicated that your school does not offer an exclusively online degree-bearing program, why?
4. How are the courses that are offered online being selected?
5. How do you envision online education to look in the next 3 to 5 years?
6. Generally, are you satisfied with the development of online learning at your institution?

About the Tools:

1. How were the tools selected for your online learning program? Was there an evaluation process?
 - a. If so, please describe the process and people involved
2. What is the typical approach to how new tools are introduced to faculty / students / administrators?
3. How do you get feedback on the effectiveness of the tools that you are offering?
4. Are you satisfied with the online tools your program is using? (why/why not?)
5. What would you change about the tools that you currently use?
6. Have you implemented any courses in a MOOC?
 - a. Will you do more / less?
 - b. Why?

About Support and Training:

1. Do you feel that there is a particular teaching and learning style best for online learning?
 - o If so, what is it?
 - o Do you feel that it influences your tool selection process?
2. Generally, do you think your faculty know how to use the majority of the online tools effectively for teaching and learning?
3. Generally, do you think your students are able to use the tools well?

Appendix C

Sample Email Sent to Participants

Note: letter adapted to each participant, link was to an anonymous survey

Dear <<subject name>>,

I am reaching out to you to ask if you would participate in a research study that I am conducting for my doctoral dissertation at Teachers College, Columbia University. We met <<date>> at the <<location>> and spoke a little about my study on online learning tool selection. More specifically, the topic is online learning platform and tool selection and the research explores how higher education institutions select the tools used to deliver and support online teaching and learning.

My personal interest in the topic is very much linked to my own teaching and learning, as well as my professional work as a web developer in higher education. I have taken many online courses, starting in 1998, and have had the opportunity to teach online using a variety of online platforms and tools. While I have had the opportunity to use and even develop online tools, it is of great interest to me, and I feel can be of interest to all educators working online, to better understand the challenges and best practices in the field. A copy of the final report will be provided to you, which I hope will be informative.

I am hopeful you are still interested in taking the online survey, which should take less than a half hour to complete. During the study, you will also be asked to indicate if you would have interest in participating in a follow up interview via email, phone or Skype. I will personally be conducting all of the research for this study and your name and institution will be kept confidential in the study.

In hopes that you are interested, I am supplying a URL to the survey below. Please do not hesitate to contact me if you have further questions.

Survey Link: <<survey link>>

Sincerely,
Paul Acquaro
Doctoral Candidate,
Teachers College, Columbia University
pa117@tc.columbia.edu
732-781-5931