

Qualitative Research Proposal:
Higher Education Faculty and Technology
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Introduction

The past 40 years has seen a rapid evolution of technology, in our homes, in industry, and in education. Many of today's students have been immersed in this technology since birth, and find traditional educational practices, such as reading textbooks and listening to lectures, to be boring. One trend in higher education is to install new technology, such as smartboards and digital projectors, in classrooms so faculty can incorporate this innovative technology into their courses. However, installing equipment is not enough to positively impact learning. It is important to redesign the curriculum to develop digital literacy to enable students to use technology to master content (Coskun, 2015).

Ahmad (2015) had three suggestions to improve higher education. First, teachers need to view students as partners in the learning process, not recipients of knowledge. Second, to take advantage of technology, teachers must incorporate training into their professional growth plan. Third, teachers should focus on helping their students develop skills such as critical thinking and problem solving that are desired by today's employers (Ahmad, 2015).

This qualitative study involves exploring higher education faculty use of technology, how they learn about emerging technologies, and how they would prefer to learn about technology. This study is important because it will lead to an understanding of best practices in preparing to teach using technology. This information will be used to create more effective professional development offerings to support faculty as they seek to introduce technology in the classroom.

Statement of the Problem

There is a disconnect between today's college students, who grew up immersed in digital technology, and higher education faculty, many of whom are not as comfortable with emerging

technology. Universities have invested in technology such as smartboards and digital projection systems, but this investment has not changed learning outcomes. Kirkwood and Price (2013) noted that having the technology available is not enough, and that instructors must adapt their curricula to effectively use the technology to enhance learning outcomes. This study seeks to understand how faculty use technology, how they learn about technology, and how they would like to learn about technology.

Purpose

The purpose of this study is to understand how faculty currently use technology, how they learn about technology, and how they would prefer to learn about technology. Ultimately, the goal is to develop best practices for professional development experiences and ongoing support for faculty who adopt technology in the classroom. The audience for this research is the faculty in higher education settings who wish to become more effective in using technology to enhance learning outcomes.

Research Questions

This study will focus on three major questions:

1. How does the faculty member use technology, in their personal life, in the office, and in the classroom?
2. How does the faculty member learn about emerging technologies for education?
3. How would the faculty member prefer to learn about emerging technology?

Limitations, Delimitations and Assumptions

A potential limitation of this study is that there is no guarantee that the faculty who agree to participate are representative of all similar faculty in terms of experience with technology and preferences in learning methods. A delimitation of this study is that it will be limited to up to 30 participants who are faculty members at public universities in New Jersey, using a purposeful sampling technique (Creswell, 2014b). The study assumes that each participant in the study will answer the questions truthfully, and will be open to sharing their experiences and preferences.

Review of Select Literature

Introduction

This study will explore some of the issues that exist when faculty adopt innovative technology in their classroom. A selection of the existing literature on the subject will be reviewed, to gain insights into the technological prowess of students and faculty. Various options for incorporating technology into courses will be considered. The need for faculty to be confident in their knowledge of technology in order to incorporate it into courses, and studies regarding measures of faculty self-efficacy will be explored. Lastly, the theoretical background of using technology in the classroom will be discussed.

Students as Digital Natives

Students who were born after 1980 have grown up in a world full of technology. Technology is infused in every aspect of their lives, from gathering information to social interactions. Prensky (2001a, p. 1) developed the idea of “digital natives” to explain the characteristics of these students. He believed that the digital native’s brain is actually different from the brains of the generations before them, and these students require different teaching

methods. This idea is rooted in the science of neuroplasticity, which states that the brain physically changes when it is exposed to new stimuli (Prensky, 2001b).

Prensky's construct of the digital native is well known, but further research points to other factors beyond chronological age which also impact whether an individual is a digital native. For example, Helsper and Eynon (2010) conducted a quantitative study of 2,350 participants in the United Kingdom, using a face-to-face survey technique. That study found that factors other than generation, including the amount of digital media in the household, can also impact the student's comfort with digital technology (Helsper & Eynon, 2010).

Faculty as Digital Immigrants

Just as persons born after 1980 are digital natives, Prensky (2001a) uses the term "digital immigrant" to describe those born in prior generations. Many faculty members in higher education fall into this demographic. Prensky notes that digital immigrants can learn to use technology, but just as in learning to speak a new language, they will always have an "accent" (Prensky, 2001a, p. 3).

In contrast, Helsper and Eynon (2010) concluded that because generation is not the only determinant of digital native status, with the proper effort a person born prior to the digital era could become a digital native. They noted the limitations of the quantitative design of their study, and suggested that more qualitative research would be required to truly understand this digital native vs. digital immigrant distinction (Helsper & Eynon, 2010). To use a different analogy, Prensky's concept is like birthright citizenship, one only attains it by being born a citizen. Helsper and Eynon's concept is like becoming a naturalized citizen: one is born a citizen of one country, but by hard work can become a naturalized citizen of another, with all the rights of one born in the new country.

Changing Teaching Methods for Digital Native Students

If we accept the premise that digital natives have different brains than digital immigrants, it follows that to effectively teach them will require new techniques. Digital native students have the world at their fingertips because they are constantly connected to the Internet. The traditional lecture is not interactive enough, and information is not delivered quickly enough, to satisfy these students. Thompson (2015) conducted research on digital native students to add the student's own voices to the prior body of knowledge. She identified eight female university freshmen from a group of 388 survey respondents in an earlier study. She then used a semi-structured design to understand the connection the students made between technology and learning. Several themes emerged from this study, including that students felt that technology assists learning. They also felt that technology makes the tasks of daily life more convenient. Most of the participants noted a concern about younger children spending too much time with technology, and some advocated a more traditional approach to elementary and middle school teaching, at the same time as they were advocating for increased technology use at the university (Thompson, 2015).

Siegel and Claydon (2016) studied the effect of an innovative classroom with modular seating and state-of-the-art technology on faculty teaching in a university setting. While the physical space was significant in the faculty responses, the faculty also reported that they used multiple techniques to teach in the space. The classroom included Apple TV technology, which can quickly and easily change inputs. The faculty reported that the flexibility of being able to share any type of Internet site was important, and that students were able to interact with the content using technology as well. The instructors noted an increase in student engagement and in the quality of classroom discussions (Siegel & Claydon, 2016).

Many students in higher education settings use their smartphones constantly. Tossell, Kortum, Shepard, Rahmati and Zhong (2015) conducted a study which provided smartphones to students who did not own one, and logged their usage for a year. They found that after the novelty of having the phone wore off, the students did not use the phones as much as they did at the beginning of the study. At the end of the study, the students reported that they felt the use of the phones was an obstacle to them reaching their educational goals. The authors recommended that any incorporation of smartphones into education be in the form of specific tasks (Tossell, Kortum, Shepard, Rahmati & Zhong, 2015).

Similarly, Nguyen, Barton and Nguyen (2015) studied the use of iPads in education. They found the technology to be promising, but noted that to date the technology has not lived up to its potential. They note that it is not enough to have the hardware, it is important to thoughtfully incorporate that hardware into the curriculum.

Gülbahar, Rapp, Kills and Sitnikova (2017) recently reviewed the use of social media in higher education. They found that instructors in their study were enthusiastic about incorporating social media into their courses, but have to rely on themselves to learn and implement these tools. Their study pointed to the need for training and assistance in selecting the proper tool for the task at hand. The authors developed the Social Media Toolkit website, to help faculty select the appropriate social media application, and learn to integrate that application into the classroom (Gülbahar, Rapp, Kills & Sitnikova, 2017).

Faculty Self-Efficacy in the Use of Technology

Because many faculty members are not digital natives, it is important to provide support and training to develop skills in technological tools. Several studies have been completed recently to measure faculty self-efficacy with respect to technology. Garrett (2014) studied the

faculty at a southeastern research university, using her own higher education-based modification of the TPaCK survey, known as HE-TPaCK. The TPaCK framework measures dimensions of technology training, pedagogy knowledge, content knowledge, as well as four additional domains which indicate the overlap of each of the primary domains with the others. Most of the participants in this study indicated that they have the knowledge to incorporate technology with pedagogy and content knowledge, but that continued support and training are required for growth in this area. The idea of incentives for faculty to hone their technology skills was also discussed in the study (Garrett, 2014).

Lavadia (2017) conducted a mixed methods study of science faculty in the higher education setting, using the TPaCK framework and Rogers' theory of diffusion of innovation. The study was designed to measure the faculty's perceived competency in the use of technology in education, and to determine if this competence was a predictor of adoption of technology in the classroom. This study found that to learn about new technologies, participants avail themselves of professional development opportunities, and learn on their own. They noted that troubleshooting and support for technical difficulties was a problem (Lavadia, 2017).

Theoretical Perspectives

Flavin (2011) examined some of the theoretical perspectives surrounding disruptive technology, which is technology that is not designed specifically for education, but is being used to enhance and promote learning. The first theory he discussed was Lave and Wenger's Community of Practice. He notes that using technology can enable students to collaborate and work toward common goals. Flavin notes that using disruptive technology "blurs the boundaries" between education and social activity (p. 3). Stark and Smith (2016) specifically suggest the

formation of a Community of Practice to help faculty balance their need for support with the lack of available resources for professional support systems.

Flavin (2011) also discusses the theory of Expansive Learning, developed by Engestrom as an offshoot of Vygotsky's Activity Theory. Activity Theory is depicted as a triangle, with points of the subject, the tool, and the object, leading to an outcome. Engestrom further developed this concept by adding another layer, a social element, and rules, and changing the simple triangle diagram into a structure with multiple nodes interacting to lead to the outcome (Flavin, 2011).

Another theory that is important in the question of whether faculty adopts technology is Rogers' Diffusion of Innovation theory. Rogers focuses on the reasons that people adopt innovations, and identified five important dimensions. They are the relative advantage of the new technology over the existing technology, compatibility of the new technology with existing practice, simplicity and ease of use of the new technology, the ability to try the technology on a limited basis, and being able to easily see the results of adopting the innovation. Rogers also notes the importance of a peer-to-peer network to support new adopters of technological innovations (Robinson, 2009).

Summary

Kirkwood and Price (2013) noted that while much has been written about using technology to enhance learning, little has been written to define exactly what that means for students and for faculty. They state that the technology does not enhance the learning by itself. It is the instructor who is responsible for the change, by thoughtfully incorporating technology into teaching.

This study will seek to understand what technology is used by faculty, and how faculty learn about emerging technologies. The goal of the study is to begin to develop a best practice that will support faculty as they make the transition to using technology to enhance learning.

Methodology

Introduction

Much has been written about meeting the needs of current college students with respect to engaging them in the learning process. In addition, there is a shift in priorities to ensure that students graduate from college with the 21st century skills that employers need. To meet these needs, universities have made significant investments in technology in the classroom. However, installing equipment in classrooms does not ensure an improvement in learning outcomes. The instructor holds the key to effective incorporation of technology into the curriculum, to enhance student learning and skills.

The study of faculty implementations of technology is important, because the instructor is the driving force behind the use of technology to enhance student learning and meet the needs of today's students. This qualitative study will focus on learning how faculty use technology in their homes, offices, and classrooms. It will explore how faculty learn about new technologies, and how they would prefer to learn about emerging technology. The purpose of the study is to understand how faculty interacts with technology. As a result of this study, a best practices document will be created to help support faculty as they learn new technologies. This chapter will explain the choice of study type, the research design, and the data collection procedures.

Research Design

This research will be conducted as a qualitative study. The researcher holds a worldview that people learn by experiencing phenomena together, and adding their own personal

perspective. This social constructivist view lends itself to studying the application of emerging technology by undergraduate faculty, as faculty learn about the technology through others, either in person or in media, and then interpret that technique to adapt it to their own situation. The study will be conducted at the faculty member's site, to assist the researcher in understanding the context of the phenomenon. The researcher's interpretation of the data will also be influenced by her own experiences, but the researcher will make every effort to remain neutral in the analysis of the data (Creswell, 2014a).

This study will focus on three major questions:

1. How does the faculty member use technology, in their personal life, in the office, and in the classroom?
2. How does the faculty member learn about emerging technologies for education?
3. How would the faculty member prefer to learn about emerging technology?

To enhance the validity of the study, data will be collected using triangulation of sources. The primary means of data collection will be focus groups, in which five to ten participants will gather and respond to questions. This may encourage quiet participants to participate. However, the researcher will have to take care that no participant dominates the group. For participants who are unable to attend a focus group, individual interviews will be scheduled. These techniques are similar, in that the same set of questions will be used in both situations (James, Milenkiewicz & Bucknam, 2007). The transcripts will be member checked by the participants to increase credibility (Creswell, 2014b).

Population and Sample

All higher education faculty members are faced with choices regarding whether to incorporate technology into their courses. For the purposes of this study, the population will be limited to faculty who teach at public universities in New Jersey. A purposeful convenience sample is being utilized for this study, because it is exploratory in nature, data will be collected in person by the researcher, and there is no funding available to permit travel out of the region. The sample will be criterion-based to the extent that all full-time undergraduate faculty at the selected universities will be contacted and invited to participate in the study (Marshall, 1996).

A sample size of 30 has been selected for this study. This sample size aligns with Nastasi's (n.d.) suggested sample sizes for interviews, and for action research. It is also aligned with the suggestion of convening focus groups of five to ten participants.

Researcher's Position

The researcher is a doctoral student in the field of Educational Technology Leadership. The researcher currently teaches at the undergraduate level, and tries to incorporate technology into courses to enhance student learning. Therefore, the researcher may bring personal experiences to the study. Care will be taken to remain objective in reporting and interpreting the data collected during the study. The researcher has no prior interaction with the participants in the study.

Procedures

To complete this study, the following procedures will be used:

- The proposal for the study will be submitted to the Institutional Review Board for approval

- Permission to conduct the study will be sought from the senior academic officer in each of the initial three target universities. If the desired sample is not obtained through recruiting at these universities, additional universities will be added
- The proposal for the study will be submitted to the Institutional Review Board of each of the target universities for approval
- Once approval has been received, arrangements will be made to hold focus groups on campus
- With the help of the target university staff, e-mail invitations will be sent to all full-time faculty members at the target university. The e-mail will contain a description of the survey, an informed consent document, and focus group dates
- If a faculty member is willing to participate, but cannot attend a scheduled focus group, an individual interview will be scheduled
- Both focus groups and individual interviews will be conducted using a semi-structured format. See Appendix A for preliminary questions
- All interactions will be recorded, and the recordings will be transcribed.
- Transcripts will be shared with participants for member checking, to ensure that their responses were captured accurately
- Transcripts will be coded by the researcher, and using NVivo software, to discover themes in the data
- To protect individual participants, all names in the final report will be pseudonyms, and the name of their university will be altered
- The final report will be prepared, and published results will be provided to participants who requested them

Data collected will be organized into folders, with electronic backup files created. Access to this data will be limited to the researcher. At the end of the fifth year after the publication of the results, the original data will be destroyed by secure methods.

Projected Timeline

July 2018	Submit proposal to IRB
August 2018	Contact initial three universities
September 2018	Contact faculty at target universities
October 2018	Conduct focus groups and individual interviews
November 2018	Continue identifying participants and conducting focus groups/interviews (as needed)
December 2018	Provide transcripts to participants for member checking
January 2019	Analyze data for trends
February 2019	Produce final report

Conclusion

The completion of this study will lead to insights into methods for assisting higher education faculty with incorporating emerging technology into the classroom. The themes that emerge will result in opportunities for further study. As a product of this research, best practices will be identified, and a professional development plan will be designed.

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Appendix A

Preliminary questions for Focus Groups and Interviews

- Do you use technology at home?
- What kind of technology do you use at home?
- Do you use technology at work, outside the classroom?
- What kind of technology do you use outside the classroom, what tasks?
- Do you use technology in the classroom?
- What kind of technology do you use in the classroom?
- How do your students react when you use technology in your presentations?
- How do you find out about new technology that is available?
- How do you learn new techniques in technology for the classroom?
- How would you prefer to learn new techniques for the classroom?
- Do you have any other comments you would like to make about using technology in the classroom?

Thank you for your assistance!!