

Faculty and Technology in Higher Education:

A Mixed Methods Approach

Veronica O'Neill

New Jersey City University

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Brief Description of the Study

College students today have grown up in a world full of technology. To engage these students, it is necessary to modify the traditional educational technique of lectures to a more technology-rich experience (Lumpkin, Achen & Dodd, 2015). Many faculty members in higher education did not grow up in this technological society, and they have to learn both the technology and how to effectively integrate it into teaching and content (Coskun, 2015). Using the TPACK framework, this mixed methods study will seek to measure faculty perceptions of their knowledge of technology, pedagogy and content (Mishra & Koehler, 2006). The study will focus on tenured, tenure-track, and adjunct faculty in higher education. A modified version of Garrett's (2014) HE-TPACK survey will be used to capture the quantitative data, and qualitative data will be captured through focus groups and interviews.

Research Problem

In order to effectively engage and teach today's college students, who grew up with digital technology, faculty must find new ways to deliver instruction using technology. In many cases, universities have made significant investment into classroom technology, but unless a faculty member is knowledgeable about this technology and how it can be used to deliver the curriculum, it is not effective (Kirkwood and Price (2013). This study will seek to understand faculty perceptions of technology, how faculty members learn about technology, and how they would prefer to learn about emerging technology. The goal of the research is to develop a best practice to help faculty embrace new technology and use it effectively to enhance student learning.

Research Purpose

The purpose of this convergent mixed methods study is to bridge the gap between the existing quantitative studies on this topic, such as Garrett (2014) and the existing qualitative studies on this topic, such as Reimer (2002). By collecting both quantitative survey data and qualitative data from focus groups and interviews, and combining the results of those datasets, a more complete picture of the problem will be revealed (Creswell & Plano Clark, 2017).

Research Questions

The following questions will be investigated in this study:

1. How do higher education faculty members assess themselves with respect to the TPACK dimensions of technology, pedagogy and content?
2. How do higher education faculty members utilize technology in their classrooms?
3. Is there a relationship between the self-assessment of the faculty and their incorporation of technology in the classroom?

Significance of the Study

This study is important because a greater understanding of faculty self-assessment data can lead to improved professional development opportunities and more effective faculty support. Garrett (2014) notes that while the TPACK framework has been studied extensively in K-12 education, there has been much less research on higher education and TPACK. She also advocated for the use of a modified HE-TPACK instrument by future researchers to allow data to be compared across studies (Garrett, 2014).

This study also seeks to understand how faculty currently use technology in the classroom, how they are introduced to emerging technology, and how they prefer to learn about innovative technology. The understanding of the combined quantitative and qualitative results

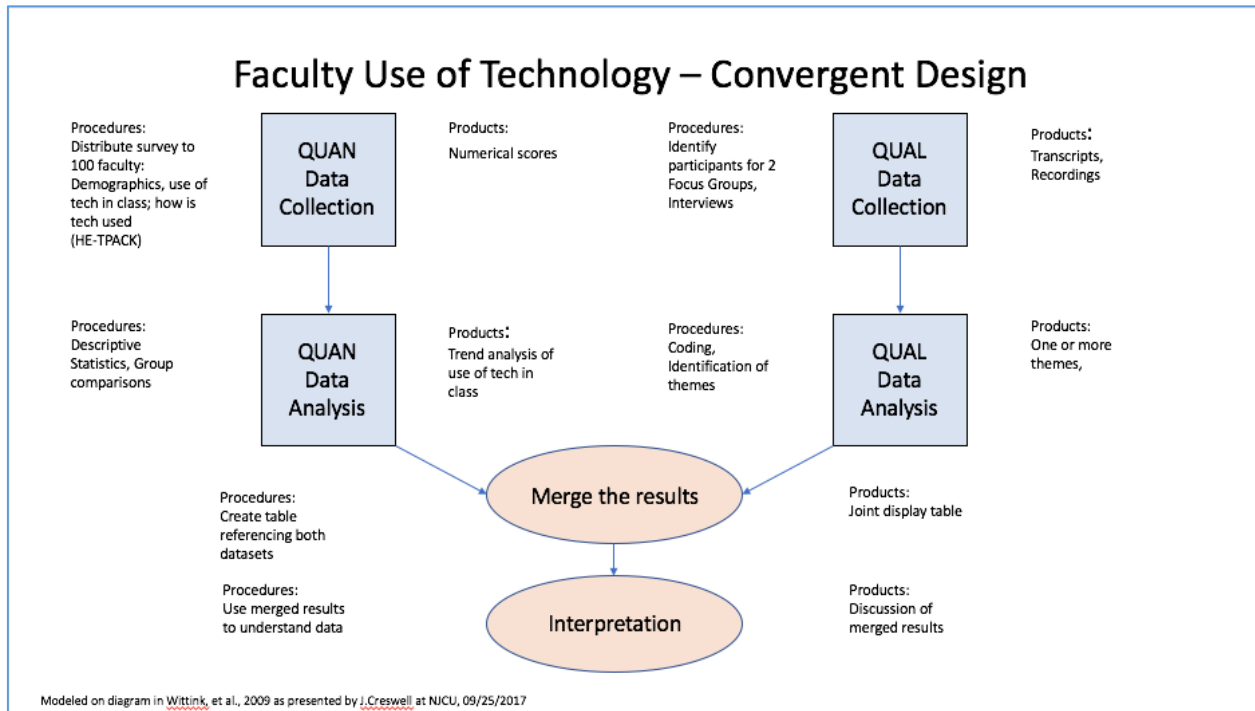
could assist universities in planning and delivering effective development opportunities to faculty to help them enhance student learning.

Research Design

This convergent mixed methods study will combine quantitative data collection through a survey with qualitative data collecting using focus groups and interviews. The quantitative phase will attempt to extend the work that was started by Garrett with respect to higher education faculty self-assessment of the TPACK domains. The use of a modification of the HE-TPACK survey will ensure that this dataset can be compared and contrasted to others which were developed using the same instrument. The qualitative phase will seek to create a detailed picture of how faculty use technology in the classroom, and how they learn about technology. Taken together, the data from the two strands should produce a detailed description of faculty use of technology in higher education.

Creswell and Plano Clark (2017) note that mixed methods research is suited to situations where neither quantitative nor qualitative data are sufficient to address the research problem. Patton (2002) describes the worldview of a mixed methods researcher as pragmatic, seeking to address a real-world problem in a realistic manner. Greene (2008) points to a convergent mixed methods study as appropriate when the researcher wishes to triangulate data to better support assertions based on that data. Figure 1 below represents the research design in a graphical format.

Figure 1: Diagram of Faculty Use of Technology Study Design



Literature Review

Digital Natives vs. Digital Immigrants

Prensky (2001a) developed the idea of “digital natives” to describe those born after 1980, who have grown up in a world with technology all around them. Prensky believed that these students have different brain structures than those before them, that the brain responds to these stimuli by creating new pathways. This scientific theory, called neuroplasticity, leads to the notion that digital natives require different teaching practices than students in generations before them (Prensky, 2001b).

Many accept the concept of digital natives, but some scientists believe that there are more variables than chronological age involved. For example, Helsper and Eynon (2010) studied 2,350 students in the United Kingdom. They found that other factors, such as the amount of digital

technology in the home, may also have a significant impact on the student's comfort with technology (Helsper & Eynon, 2010).

In contrast to digital natives, Prensky (2001a) describes those born before 1980 as "digital immigrants". Many current college faculty members fall into this category, and have to learn to use technology as adults. Prensky acknowledges that it is possible for the digital immigrant to become fluent in technology, but that they will always retain an "accent" (Prensky, 2001a, p. 3).

Helsper and Eynon (2010) again provide a moderating perspective to Prensky's theory. They believe that with a focused effort a person born before 1980 can master technology, and even become a digital native. They acknowledged that their previous quantitative study was insufficient to fully support this position, and that further qualitative studies would be necessary to develop a complete understanding of digital natives and digital immigrants (Helsper & Eynon, 2010).

Lea and Jones (2011) also offer a moderating perspective on digital natives and their need for different approaches to learning. They reference studies in the United Kingdom that have shown that all students do not have the same access to technology. They also look at education from the perspective of literacies, and note that being digitally literate does not imply that one cannot also be literate in traditional educational techniques. They urge caution in the wholesale move toward digital learning at the expense of traditional techniques (Lea & Jones, 2011).

Teaching Today's Students

Many scholars believe that teaching digital natives effectively requires a change in techniques on the part of the faculty. Digital natives have mobile devices that keep them in constant contact with the outside world. They can access any information they want instantly on

the Internet right from their phones. They can become impatient and bored when faced with a traditional lecture format, which is primarily one-way communication. Thompson (2015) studied digital natives and their attitudes toward technology and learning. The eight female students she interviewed felt that having access to technology made learning easier, and assisted in the activities of daily living. They also expressed concern that young children spend too much time on technology, and they felt a traditional education was better for them (Thompson, 2015).

Tossell, Kortum, Shepard, Rahmati and Zhong (2015) wanted to study the impact of owning a smartphone on learning. They supplied students who did not own a smartphone with a device and data plan for one year, logging and tracking their use of the devices. After an initial period of high activity, the amount of activity dropped dramatically. The students reported that they felt that having the phones posed an obstacle to achieving their educational goals. The researchers concluded that to use mobile telephones effectively, students need to be assigned specific tasks (Tossell, Kortum, Shepard, Rahmati and Zhong, 2015).

Gülbahar, Rapp, Kills and Sitnikova (2017) note that social media is another innovation that is quite familiar to digital natives. Many educators are enthusiastic about the idea of incorporating this technology into their classroom, but are unsure how to do it. With this technology, as with many others, training and support is needed for faculty to be effective in its use. They created the Social Media Toolkit website, to help faculty choose the best social media application for their specific task, and to integrate that application into their curriculum (Gülbahar, Rapp, Kills and Sitnikova, 2017).

Another perspective on using social media to augment face-to-face learning was explored by Hung and Yuen (2010). They studied students in Taiwan who used a social networking site called Ning as a supplement to their face-to-face class meetings. The researchers found that

using the social networking site increased the community of practice in the classroom, and was generally a positive experience for the students (Hung & Yuen, 2010).

The physical characteristics of the classroom can also have an impact on teaching. Siegel and Claydon (2016) studied a specially designed classroom with multiple screens, modular seating, and Apple TV devices. The faculty who taught in this classroom changed their own techniques to use the technology in the room, and found that students were more engaged in the lessons as a result. The faculty noted that they valued being able to share the information on any device in the room, both their own and the students', with the entire class using the Apple TV device (Siegel and Claydon, 2016).

Self-Efficacy and Technology

Garrett (2014) studied faculty members at a Southern Research I university, assessing their feelings of self-efficacy using her HE-TPACK survey. This survey, based on the TPACK survey often used in a K-12 setting, has been modified to be more appropriate for higher education. It measures technology knowledge, pedagogy knowledge, and content knowledge, and the places they overlap to form new domains. The participants in her study indicated that they felt comfortable combining technology, pedagogy and content knowledge in the curriculum, but needed continuous support and training to grow. They also noted that incentives may be needed to encourage faculty to participate in these opportunities (Garrett, 2014).

Lavadia (2017) also studied higher education faculty using the TPACK framework. Their mixed methods study focused on science faculty, and looked at their perceived competency in technology knowledge, pedagogy knowledge and content knowledge. The study compared the faculty's self-assessment with their use of technology in the classroom. The study found that a high level of technology knowledge was predictive of a high level of adoption of technology in

the classroom. The study also looked at how faculty learned about new technology, and what obstacles they encountered. Participants noted that they take part in professional development opportunities, and that they learn about new technologies on their own. They also identified difficulty in troubleshooting and lack of support for technical difficulties as significant problems (Lavadia, 2017).

Faculty Learning about Technology

Since faculty members often did not grow up with technology, they need training to understand how to choose appropriate technology tools, and to incorporate those tools into their curriculum. Canela (2013) conducted a single case study of faculty members and administrators, and found that faculty members need support in the rapidly changing environment of educational technology today. The faculty respondents indicated that they needed systematic professional development for technological innovations, and that it would be helpful if they could be paid to participate in professional development (Canela, 2013).

Reimer (2002) also studied faculty self-efficacy about technology and the incorporation of technology into the classroom. This study involved faculty participation in a workshop about using technology. It was somewhat unusual in that it included classroom observations by the researcher after the workshop. In this case study, faculty was found to have low self-efficacy in technology, or had high self-efficacy that declined when faced with difficulties in using technology. This had a negative impact on the use of technology in the classroom. The workshop that was studied did not produce what Bandura would call a “mastery experience,” which allows participants to experience mastering a technique. This is one of the ways to develop self-efficacy in Bandura’s model. Participants also noted a lack of role models at the workshop, and would have liked to hear from successful innovators with technology in the classroom. Participants also

noted a lack of time to incorporate the technology into their instruction, due to other commitments including teaching, advising and research. The overarching conclusion was that the planning of the professional development had to take the specific needs of the participants into consideration if the experience was to change behavior (Reimer, 2002).

Dailey-Hebert, A., Norris, V. R., Mandernach, B. J., & Donnelly-Sallee, E. (2014) noted that adjunct faculty is the fastest growing segment of higher education faculty, and many universities rely heavily on adjuncts. They conducted a study of adjuncts, and found that most preferred asynchronous professional development opportunities that could be completed independently. Many adjuncts teach online, and would like to receive training from the Distance Learning department, as well as their own academic department. They are much less interested in general offerings by the Center for Learning or similar support areas (Dailey-Hebert, A., Norris, V. R., Mandernach, B. J., & Donnelly-Sallee, E., 2014).

Theoretical Framework

The primary theoretical framework for this study is the TPCK framework proposed by Mishra and Koehler (2006). Their theory builds on the work of Shulman, who looked at teaching as a function of content and pedagogical knowledge (PCK). Mishra and Koehler extended this idea further, including the need for technology knowledge for effective teaching (Mishra & Koehler, 2006). This theory is usually used to assess the technology, pedagogy and content knowledge of K-12 teachers, but has recently been applied to higher education studies as well.

The self-assessment referenced in the TPCK theory leads to action under Bandura's Self-Efficacy Theory. In short, this theory suggests that if a person believes they are competent in a skill, they are more likely to utilize that skill. Bandura cautions that faulty self-assessment may lead to unexpected results, and reduced action in the future (Bandura, 2012).

Methodology

Participants

The study participants will be faculty members in a public university in New Jersey. The sample will include tenured, non-tenured and adjunct faculty across multiple disciplines. All faculty members at the target university will be sent an invitation to participate in the study by e-mail. This initial e-mail will include an informed consent, see Appendix A. The quantitative phase survey will be provided to participants using a Qualtrics link. A sample size of approximately 100 respondents will be recruited.

The biggest potential issue for this phase is a low response rate. This was an issue in Garrett's (2014) original research using the HE-TPACK instrument, and she suggested that subsequent researchers modify the instrument to reduce the number of items. If the modification is not sufficient to improve the response rate, it may be necessary to add another New Jersey public university to the study.

For the qualitative phase of the study, invitations to participate in a focus group about technology will be sent to full-time, part-time and adjunct faculty at a New Jersey public university. If a faculty member is willing to participate in a focus group, but unable to do so due to scheduling issues, an individual interview will be scheduled.

The major concern for the qualitative phase of the study is that the faculty members who volunteer to participate may not be representative of the responses of all faculty members. This could have a negative impact on the best practices that emerge from this research

Instrument

The HE-TPACK survey was designed to capture faculty self-assessment of the TPACK domains. The original survey, developed by Garrett (2014), had 57 items, and she believed that

was a contributing factor in the low response rate for her study. She also suggested that the instrument be modified to make it less daunting, and hopefully increase the response rate (Garrett, 2014). The HE-TPACK instrument was validated by independent experts prior to use by Garrett (Garrett, 2014). The modified HE-TPACK instrument utilized in this study will focus only on the main TPACK domains of Technology, Pedagogy and Content, in the hope that the survey has a higher completion rate. The survey will be administered through Qualtrics, at the following link:

https://njcu.co1.qualtrics.com/jfe/form/SV_6XWw3knqPvYfqBv

The survey items can also be found in Appendix B. The author's permission to modify and use her survey in this study has been obtained, see Appendix C.

The qualitative phase will feature focus groups and individual interviews. These meetings will use a semi-structured interview format, to ensure consistency while allowing flexibility to explore topics as they are discussed. See Appendix D for the preliminary questions.

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. See Appendix E.
- Permission to conduct the study will be sought from the senior academic officer in each of the initial target universities.
- 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. For the quantitative phase, the e-mail will contain a description of the survey, an informed consent document, and a link to the survey on Qualtrics. For the qualitative phase, the e-mail will contain a description of the study, an informed consent document, and a selection of focus group dates
- If a faculty member is willing to participate, but cannot attend a scheduled focus group, an individual interview will be scheduled
- Focus groups and interviews will be use a semi-structured format.
- All interactions will be recorded with the permission of the participants, and will be transcribed.
- Transcripts will be sent to participants for member checking, to ensure accuracy
- Transcripts will be coded by the researcher, to discover themes in the data, NVivo software will also be used to assist in the coding effort
- 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 on request

Data collected will be maintained electronically, on a secure hard drive, with electronic backup files. Only the researcher will have access to this data. Five years after the publication of the results, the original data will be destroyed by secure methods.

Projected Timeline

| | |
|----------------|---|
| July 2018 | Submit proposal to IRB for approval |
| August 2018 | Contact initial universities for the qualitative and quantitative phases; submit proposal to target university IRB |
| September 2018 | Contact faculty at target universities via e-mail Quantitative phase: Include informed consent and link to survey on Qualtrics Qualitative phase: Include informed consent and invitation to participate in focus group |
| October 2018 | Conduct focus groups and interviews |
| November 2018 | Continue data collection as needed |
| December 2018 | Provide transcripts to study participants for member checking Analyze quantitative data |
| January 2019 | Code and analyze qualitative data |
| February 2019 | Combine results and produce final report of findings |

References

- Bandura, A. (2011) On the functional properties of perceived self-efficacy revisited. *Journal of Management* 38 (1) 9 – 44. DOI: <https://doi.org/10.1177/0149206311410606>
- Canela, F. (2013). Qualitative single case study exploring faculty perceived leadership behaviors influencing technology adoption in the classroom (Order No. 3691429). Available from ProQuest Dissertations & Theses Global. (1671721137). Retrieved from <https://search.proquest.com/docview/1671721137?accountid=12793>
- Coskun, Y. D. (2015). Promoting digital change in higher education: Evaluating the curriculum digitalisation. *Journal of International Education Research*, 11(3) 197. Retrieved from <https://search.proquest.com/docview/1704360365?accountid=12793>
- Creswell, J. W. & Plano Clark, V. L. (2017) *Designing and Conducting Mixed Methods Research* (3rd ed.) Thousand Oaks, CA: SAGE Publications
- Dailey-Hebert, A., Norris, V. R., Mandernach, B. J., & Donnelly-Sallee, E. (2014). Expectations, motivations, and barriers to professional development: Perspectives from adjunct instructors teaching online. *The Journal of Faculty Development*, 28(1), 67-82. Retrieved from <https://search.proquest.com/docview/1667201293?accountid=12793>
- Garrett, K. N. (2014). A quantitative study of higher education faculty self-assessments of technological, pedagogical, and content knowledge (TPaCK) and technology training (Order No. 3639104). Available from ProQuest Dissertations & Theses Global. (1620540665). Retrieved from <https://search.proquest.com/docview/1620540665?accountid=12793>
- Greene, J. C. (2008) Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research* 2 (1) 7 – 22. Doi: 10.1177/1558689807309969

- Gülbahar, Y., Rapp, C., Kilis, S., & Sitnikova, A. (2017). Enriching higher education with social media: Development and evaluation of a social media toolkit. *International Review of Research in Open and Distance Learning*, 18(1) Retrieved from <https://search.proquest.com/docview/1904894338?accountid=12793>
- Helsper, E. J., & Eynon, R. (2010). Digital natives: where is the evidence? *British Educational Research Journal*, 36(3), 503-520. doi:10.1080/01411920902989227
- Hung, H-T. & Yuen, S. C-Y. (2010). Educational use of social networking technology in higher education. *Teaching in Higher Education*, 15(6), 703-714.
doi:10.1080/13562517.2010.507307
- Kirkwood, A., & Price, L. (2013). Missing: evidence of a scholarly approach to teaching and learning with technology in higher education. *Teaching in Higher Education*, 18(3), 327-337. doi:10.1080/13562517.2013.773419
- Lavadia, L. (2017). Technological, pedagogical, and content knowledge (TPACK): An educational landscape for tertiary science faculty (Order No. 10280318). Available from ProQuest Dissertations & Theses Global. (1906328492). Retrieved from <https://search.proquest.com/docview/1906328492?accountid=12793>
- Lea, M. R., & Jones, S. (2011). Digital literacies in higher education: exploring textual and technological practice. *Studies in Higher Education*, 36(4), 377-393.
doi:10.1080/03075071003664021
- Lumpkin, A., Achen, R. M., & Dodd, R. K. (2015). Using technology-nested instructional strategies to enhance student learning. *Insight: A Journal of Scholarly Teaching* 10, 114-125.

- Mishra, P. & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record* 108(6) 1017. Retrieved from <http://draweb.njcu.edu:2323/library/content.asp?contentid=12516>
- Patton, M. Q. (2002). *Qualitative research and evaluation methods (3rd ed.)*. Thousand Oaks, CA: Sage.
- Prensky, M. (2001a). Digital natives, digital immigrants part 1. *On the Horizon*, 9(5), 1-6. Retrieved from <https://search.proquest.com/docview/214629645?accountid=12793>
- Prensky, M. (2001b). Digital natives, digital immigrants part 2: Do they really think differently? *On the Horizon*, 9(6), 1-6. Retrieved from <https://search.proquest.com/docview/214641811?accountid=12793>
- Reimer, M. S. (2002). *The effects of a professional development workshop on faculty integration of technology in the university classroom* (Order No. 3071568). Available from ProQuest Dissertations & Theses Global. (276309588). Retrieved from <https://search.proquest.com/docview/276309588?accountid=12793>
- Thompson, P. (2015). How digital native learners describe themselves. *Education and Information Technologies*, 20(3), 467-484. doi:<http://dx.doi.org/10.1007/s10639-013-9295-3>
- Tossell, C. C., Kortum, P., Shepard, C., Rahmati, A. & Zhong, L. (2015). "You can lead a horse to water but you cannot make him learn: Smartphone use in higher education". *British Journal of Educational Technology* 46(4), p. 713.

Appendix A
Informed Consent

Dear Faculty Member,

I am a doctoral student at New Jersey City University, and am conducting research under the supervision of Dr. Christopher Carnahan on faculty perceptions of technology, how faculty members learn about technology, and how they would prefer to learn about emerging technology. Your participation is important to help us understand this issue.

To participate, please complete the survey at the link below, which should take less than 15 minutes. Your answers and your identity will not be revealed to any other party. There are no known risks to participating in this study. The data collected during this study will be held securely for five years. There is no direct benefit to you from participating in this study. Upon completion of the report, a copy of the findings will be sent to you on request. Your participation is voluntary, and greatly appreciated.

If you are interested in participating in this study, please answer the survey questions at the link attached. If you have any questions, please contact me, Veronica O'Neill, at voneill@njcu.edu.

This study has been reviewed and approved by the NJCU Institutional Review Board.

Thank you in advance for your participation in this project.

Link to survey:

https://njcu.co1.qualtrics.com/jfe/form/SV_6XWw3knqPvYfqBv

Appendix B
Survey Instrument

Teaching with Technology

This survey will collect data about your perception of your teaching knowledge and experience, the use of technology in your classroom, and about how you learn about technology. Please note that your responses will be kept confidential, and your name will never be associated with your answers

Please type your name to indicate your consent to participate in this survey:

Page Break

With respect to Pedagogy:

| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I have a clear understanding of pedagogy (e.g., designing instruction, assessing students' learning. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am familiar with a wide range of practices, strategies, and methods that I can use in my teaching. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know how to assess student learning. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know how to motivate students to learn. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |



With respect to Technology:

| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I am familiar with a variety of hardware, software and technology tools that I can use for teaching. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know how to troubleshoot technology problems when they arise. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I do not know how to use technology in my everyday life. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I recognize that technology use can have positive and negative effects. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I cannot decide when technology can be beneficial to achieving a learning objective. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I can decide
when
technology
may be
detrimental to
achieving a
learning
objective.



With respect to Content:

| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I have a comprehensive understanding of the curriculum I teach. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I understand how knowledge in my discipline is organized. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am familiar with the common preconceptions and misconceptions in my discipline. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I can explain to students the value of knowing concepts in my discipline. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I can make connections between the different topics in my discipline. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I stay abreast of new research related to my discipline in order to keep my own understanding of my discipline updated. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

With respect to Technology, Pedagogy and Content:

| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I can effectively integrate educational technologies to increase student opportunities for interaction with ideas. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have different opportunities to teach specific curriculum content topics with technology. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I can use appropriate instructional strategies to teach specific curriculum content topics with technology. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I cannot determine when a technology resource may fit with one learning situation in my discipline, and not with another. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I can flexibly incorporate new tools and resources into content and my teaching methods to enhance learning.

I understand how digital technologies can be used to represent content in a variety of formats.

I can use teaching methods that are technology-based to teach content and provide opportunities for learners to interact with ideas.

I understand what makes certain concepts difficult to learn for students and how technology can be used to leverage that knowledge to improve student learning.

I do not understand how to integrate technology to build upon students' prior knowledge of curriculum content.

I know how to operate classroom technologies and can incorporate them into my particular discipline to enhance student learning.

I know how to integrate the use of educational technologies effectively into curriculum-based learning.

Please answer these questions about your use of technology in the CLASSROOM:

Please indicate if you use any of these technologies in the CLASSROOM:

- Enrichment activities for students
 - Video lessons
 - Game software
 - E-mail
 - Attendance
 - Social media
 - Word processing programs
 - Spreadsheets
 - Other (please describe) _____
-

How often do you use technology in the CLASSROOM?

- Daily
 - 4-6 times a week
 - 2-3 times a week
 - Once a week
 - Never
-

Please rate your comfort level with using technology in the CLASSROOM:

- 5 Very Comfortable
- 4 Comfortable
- 3 Neutral
- 2 Uncomfortable
- 1 Very Uncomfortable

Almost done! Please answer a few questions about learning about technology:

With respect to Technology Training:

| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Technology training would enhance my teaching | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| It is the University's responsibility to train me to use technologies that will enhance my teaching. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The University should not make technology training a requirement for faculty. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Technology training should be offered in each academic department at my University. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How do you find out about new technology?

- Professional development programs
 - Outside conferences
 - Online professional networks
 - Talking with colleagues
 - Other (please describe) _____
-

When learning about a new technology, I like to:

- Figure it out myself
 - Study from a book
 - Watch online video tutorials
 - Attend an in-person workshop
 - Other (please describe) _____
-

In the past year, how many professional development sessions about technology have you attended?

- None
 - 1 or 2
 - 3 or 4
 - 5 or more
-

What factors do you consider in deciding to attend a professional development session?

- Interest in the topic
 - Prior knowledge of the topic
 - Scheduling of the program
 - Internal or external presenter
 - Other (please describe) _____
-

Please answer the following questions to help us interpret the results:

Age

- 20-29
 - 30-39
 - 40-49
 - 50-59
 - 60 and over
-

Number of years of full-time higher education teaching experience:

- 0
 - 1 - 4
 - 5 - 9
 - 10 -14
 - 15 - 19
 - 20 +
-

Primary Subject taught

Thank you for your participation! Please provide your e-mail address if you would like to receive a copy of the results after publication.

Appendix C
Permission to Use Survey

Re: HE-TPaCK Survey

Kristi N. Garrett [kngarrett@yahoo.com] **Sent:** Monday, November 27, 2017 12:55 PM **To:** Veronica O'Neill **Attachments:**KRISTI GARRETT Dissertatio~1.pdf (2 MB)

Hi Ronnie,
See my attached dissertation. I ask that you be willing to share your results. Thanks for your interest.
Kristi N. Garrett, Ph.D.
Managing Editor for Social Studies Research and Practice

http://emeraldgrouppublishing.com/products/journals/editorial_team.htm?id=ssrp

District#44 Division A Area 12 Director Technically Speaking
Toastmasters' Club VP of Public Relations; District #44
Area 15 _____ IT
Portfolio <http://thediadoctor.blogspot.com/> Yo
uTube Vlog

On Tuesday, November 21, 2017, 2:12:07 PM EST, Veronica O'Neill
<VONeill@njcu.edu> wrote:

DEAR DR. GARRETT,

I AM A DOCTORAL STUDENT IN THE EDUCATIONAL TECHNOLOGY LEADERSHIP PROGRAM AT NEW JERSEY CITY UNIVERSITY. I AM WRITING TO ASK YOUR PERMISSION TO USE A MODIFIED VERSION OF YOUR HE- TPACK SURVEY FOR A CLASS PROJECT. OF COURSE, FULL CREDIT WILL BE GIVEN TO YOU AS THE AUTHOR OF THE SURVEY.

I APPRECIATE YOUR ASSISTANCE IN THIS PROJECT. THANKS AND
REGARDS, RONNIE O'NEILL

Appendix D

Focus Group/Interview Questions

Preliminary questions for Focus Groups and Interviews

- 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!!

Appendix E IRB Application

NEW JERSEY CITY UNIVERSITY INSTITUTIONAL REVIEW BOARD

File # _____

APPLICATION FOR REVIEW OF RESEARCH

1. TYPE OF APPROVAL REVIEW REQUESTED (CHECK ONE):
 FULL REVIEW EXPEDITED EXEMPT REVIEW

2. PRINCIPAL INVESTIGATOR: Veronica O'Neill
 DEPARTMENT: Educational Technology
 PHONE: 201-555-1234
 TITLE OF RESEARCH: Faculty and Technology in Higher Education: A Mixed Methods Approach

 CO-INVESTIGATORS: none

3. PURPOSE OF RESEARCH (INDEPENDENT PROJECT, MASTER'S THESIS, AND COURSE WHICH INCLUDES COURSE TITLE, SEMESTER AND INSTRUCTOR'S NAME.) ETC.
The purpose of the research is a class project for
the Ed.D., course number EDTC 809, Fall 2017, Dr. C. Carnahan

4. IF YOU ARE A STUDENT RESEARCHER PLEASE PROVIDE THE FOLLOWING:
 MAILING ADDRESS: 123 Main Street
 CITY/STATE/ZIP: Somewhere, NJ 07700
 TELEPHONE: 201-555-1234 EMAIL: voneill@njcu.edu
 FACULTY SPONSOR NAME: Dr. Christopher Carnahan
 DEPARTMENT OF SPONSORING FACULTY: Educational Technology
 EXT. 3078 FAX: 1234 EMAIL: ccarnahan@njcu.edu
 FACULTY SPONSOR SIGNATURE: _____
 DATE: December 3, 2017

5. HAS THIS RESEARCH PROJECT BEEN CONSIDERED PREVIOUSLY BY THE IRB? YES NO
 IF YES, GIVE LAST APPROVAL DATE: _____

6. SOURCE OF FUNDING (IF APPLICABLE):

UNIVERSITY GRANTS: PLEASE INDICATE WHICH GRANT PROGRAM: (FOUNDATION, SBR)

EXTRAMURAL FUNDS: PLEASE INDICATE AGENCY NAME: _____
TITLE: _____

AWARD NUMBER: _____ DATE: _____

7. ARE YOU WORKING WITH A RESEARCHER FROM ANOTHER INSTITUTION? IF SO, BE AWARE THAT YOUR CO-INVESTIGATOR MUST ALSO SUBMIT YOUR JOINT PROPOSAL TO THE IRB AT THE INSTITUTION THAT EMPLOYEES HIM/HER.
 YES NO

8. WHAT IS THE OBJECTIVE OF THE RESEARCH?

The purpose of the research is to understand faculty use of technology in a public university setting.

9. DOES YOUR RESEARCH INVOLVE ANY OF THE FOLLOWING (CHECK ALL THAT APPLY)?

- MINORS
- PRISONERS
- PREGNANT WOMEN
- USE OF THE INVESTIGATORS' CURRENT STUDENTS AS SUBJECTS
- DRUGS OR OTHER CONTROLLED SUBSTANCES
- PSYCHOLOGICAL OR PHYSIOLOGICAL STRESS ABOVE THE LEVEL OF NORMAL EVERYDAY ACTIVITIES
- MISLEADING OR DECEIVING SUBJECTS ABOUT ANY ASPECT OR PURPOSE OF THE RESEARCH
- COLLECTION OF INFORMATION WHICH DEALS WITH SENSITIVE ASPECTS OF THE PARTICIPANTS' BEHAVIOR (ILLEGAL ACTIVITY, DRUG OR ALCOHOL USE, SEXUAL BEHAVIOR, ETC.)
- COLLECTION OF INFORMATION WHICH WOULD PLACE SUBJECTS AT RISK OF CRIMINAL OR CIVIL LIABILITY IF IT BECAME KNOWN
- COLLECTION OF INFORMATION WHICH COULD AFFECT SUBJECTS' FINANCIAL STANDING, EMPLOYABILITY, OR REPUTATION
- EXAMINATION OF EXISTING DATA, RECORDS, DOCUMENTS, OR SPECIMENS THAT ARE NOT PART OF THE PUBLIC RECORD
- CHILDREN INVOLVED IN YOUR RESEARCH WITHOUT SENSITIVE INFORMATION ABOUT THEMSELVES OR THEIR FAMILIES.
- COLLECTING OR STUDYING EXISTING DATA, DOCUMENTS, RECORDS, PATHOLOGICAL SPECIMENS OR DIAGNOSTIC SPECIMENS WHICH ARE PUBLICLY AVAILABLE AND FROM WHICH PARTICIPANTS CANNOT BE IDENTIFIED BY ANYONE OTHER THAN THE INVESTIGATOR(S).

**IF ANY OF THE ABOVE ITEMS ARE CHECKED
YOUR PROPOSAL DOES NOT QUALIFY FOR AN EXEMPT REVIEW**

10. DESCRIBE THE DESIGN OF THE RESEARCH INCLUDING WHAT WILL BE REQUIRED OF SUBJECTS (ATTACH ADDITIONAL SHEET IF NECESSARY):

The research design will be a convergent mixed methods study. A quantitative survey will be administered to faculty at public universities in New Jersey. Other faculty will be interviewed using a semi-structured format to collect qualitative data.

11. UNDER WHICH OF THE FOLLOWING CATEGORIES ARE YOU APPLYING FOR EXEMPTION?

- 1. RESEARCH CONDUCTED IN ESTABLISHED OR COMMONLY ACCEPTED EDUCATIONAL SETTINGS, INVOLVING NORMAL EDUCATIONAL PRACTICES, SUCH AS (I) RESEARCH ON REGULAR AND SPECIAL EDUCATION INSTRUCTIONAL STRATEGIES, OR (II) RESEARCH ON THE EFFECTIVENESS OF THE COMPARISON AMONG INSTRUCTIONAL TECHNIQUES, CURRICULA, OR CLASSROOM MANAGEMENT METHODS.
- 2. RESEARCH INVOLVING THE USE OF SOCIAL SCIENCE OR EDUCATIONAL TESTS (COGNITIVE, DIAGNOSTIC, APTITUDE, ACHIEVEMENT), SURVEY PROCEDURES, INTERVIEW PROCEDURES, OR OBSERVATION OF PUBLIC BEHAVIOR UNLESS (I) INFORMATION IS OBTAINED IN SUCH A WAY AS THAT THE PARTICIPANTS CAN BE IDENTIFIED DIRECTLY OR INDIRECTLY OR (II) THE PARTICIPANTS' RESPONSES, IF THEY BECAME KNOWN, COULD PLACE THE PARTICIPANT AT RISK OF CRIMINAL OR CIVIL LIABILITY OR BE DAMAGING TO THE PARTICIPANTS' FINANCIAL STANDING, REPUTATION, OR EMPLOYABILITY. (ALL RESEARCH INVOLVING SURVEY AND INTERVIEW PROCEDURES IS EXEMPT WHEN THE PARTICIPANTS ARE ELECTED OR APPOINTED PUBLIC OFFICIALS OR CANDIDATES FOR PUBLIC OFFICE. HOWEVER, CONFIDENTIALITY MUST BE MAINTAINED WHEN REQUIRED BY FEDERAL STATUTE.)
- 3. RESEARCH INVOLVING THE COLLECTION OR STUDY OF EXISTING DATA, DOCUMENTS, RECORDS, PATHOLOGICAL SPECIMENS, OR DIAGNOSTIC SPECIMENS, IF THESE SOURCES ARE PUBLICLY AVAILABLE OR IF THE INFORMATION IS RECORDED BY THE INVESTIGATOR IN SUCH A MANNER THAT PARTICIPANTS CANNOT BE IDENTIFIED.
- 4. RESEARCH AND DEMONSTRATION PROJECTS WHICH ARE FUNDED BY A FEDERAL AGENCY AND DETERMINED TO BE EXEMPT BY THE AGENCY HEAD AND WHICH ARE DESIGNED TO STUDY, EVALUATE, OR OTHERWISE EXAMINE: (I) PUBLIC BENEFIT OR SERVICE PROGRAMS; (II) PROCEDURES FOR OBTAINING BENEFITS OR SERVICES UNDER THOSE PROGRAMS; (III) POSSIBLE CHANGES IN OR ALTERNATIVES TO THOSE PROGRAMS OR PROCEDURES; OR (IV) POSSIBLE CHANGES IN METHODS OR LEVELS OF PAYMENT FOR BENEFITS OR SERVICES UNDER THOSE PROGRAMS.
- 5. EXEMPTION FOR COLLECTION OR STUDY OF EXISTING DATA: RESEARCH INVOLVING COLLECTION OR STUDY OF EXISTING DATA, DOCUMENTS, RECORDS, IF THESE DATA ARE NON-IDENTIFIABLE AND PUBLICLY AVAILABLE OR INFORMATION IS RECORDED BY THE INVESTIGATOR IN SUCH A MANNER THAT SUBJECTS CANNOT BE IDENTIFIED DIRECTLY THROUGH IDENTIFIERS LINKED TO THE SUBJECT (CODES LINKING NAMES TO DATA ARE CONSIDERED INDIRECT IDENTIFIERS).
- 6. EXEMPTION FOR STUDY OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES: UNLESS SPECIFICALLY REQUIRED BY THE STATUTE, RESEARCH AND DEMONSTRATION PROJECTS WHICH ARE CONDUCTED BY OR SUBJECT TO THE APPROVAL OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES, AND WHICH ARE DESIGNED TO STUDY, EVALUATE, OR OTHERWISE EXAMINE:
 - (A) _____ PROGRAMS UNDER THE SOCIAL SECURITY ACT OR OTHER PUBLIC BENEFIT OR SERVICE PROGRAMS
 - (B) _____ PROCEDURES FOR OBTAINING BENEFITS OR SERVICES UNDER THOSE PROGRAMS
 - (C) _____ POSSIBLE CHANGES IN OR ALTERNATIVES TO THOSE PROGRAMS OR PROCEDURES
 - (D) _____ POSSIBLE CHANGES IN METHODS OR LEVELS OF PAYMENT FOR BENEFITS OR SERVICES UNDER THOSE PROGRAMS.

IF YOUR RESEARCH IS GIVEN EXEMPTION STATUS, THE FOLLOWING MUST BE STATED ON A COVER LETTER ACCOMPANYING ANY SURVEY OR QUESTIONNAIRES.

1. A STATEMENT THAT ALL PARTICIPATION IS VOLUNTARY
2. A STATEMENT THAT YOU ARE CONDUCTING RESEARCH AND THE REASON FOR IT (MASTER'S THESIS, PUBLICATION, ETC.)
3. PURPOSE OF THE RESEARCH - WHAT YOU ARE INVESTIGATING
4. A STATEMENT THAT ALL RESPONSES WILL BE KEPT ANONYMOUS AND CONFIDENTIAL
5. A STATEMENT THAT PARTICIPANTS NEED NOT RESPOND TO ALL QUESTIONS
6. IF PARTICIPANTS ARE YOUR OWN STUDENTS, A STATEMENT THAT CLASS STANDING WILL NOT BE AFFECTED IN ANY WAY BASED ON PARTICIPATION
7. AHE NAME AND TELEPHONE NUMBER OF THE PRINCIPAL INVESTIGATOR (PI) AND FACULTY SPONSOR (IF APPLICABLE)

CLAIMS FOR EXEMPTION MAY NOT BE MADE FOR (A) RESEARCH INVOLVING CHILDREN, (B) AIDS-RELATED RESEARCH, (C) RESEARCH INVOLVING SUBSTANCE OR CHILD ABUSE OR (D) RESEARCH TO BE CONDUCTED AT THE V.A. (RESEARCH UNDER THESE CATEGORIES IS SUBJECT TO SPECIAL FEDERAL GUIDELINES.)

ALL IRB APPLICANTS MUST COMPLETE QUESTIONS 12 – 18

12. DESCRIBE THE SUBJECTS WHO WILL BE PARTICIPATING (NUMBER, AGE, GENDER, ETC.)
The participants in the study will be up to 150 faculty members at public universities in New Jersey. All participants are adults, and may be of any age or gender.
13. HOW WILL SUBJECTS BE RECRUITED? IF STUDENTS, WILL THEY BE SOLICITED FROM CLASS?
A letter will be sent to senior academic officers at New Jersey public universities, requesting their participation in this study. Individual subjects from participating universities will be sent an e-mail requesting their participation.
14. WHAT RISKS TO SUBJECTS (PHYSIOLOGICAL AND/OR PSYCHOLOGICAL) ARE INVOLVED IN THE RESEARCH?
There are no known risks to subjects in this study.
15. IS DECEPTION INVOLVED IN THE RESEARCH? IF SO, WHAT IS IT AND WHY WILL IT BE USED?
There is no deception involved in this study.
16. WHAT INFORMATION WILL BE GIVEN TO THE SUBJECTS AFTER THEIR PARTICIPATION? IF DECEPTION IS USED, IT MUST BE DISCLOSED AFTER PARTICIPATION.
After participation, focus group participants will be provided transcripts of their interviews for member checking of the data. Participants will be offered a copy of the completed study after publication, upon their request.
17. HOW WILL CONFIDENTIALITY BE MAINTAINED? WHO WILL KNOW THE IDENTITY OF THE SUBJECTS? IF A PRE AND POST TEST DESIGN IS USED HOW WILL THE SUBJECTS BE IDENTIFIED?
The names of the participants and their university affiliations will be known only to the researcher. Participants will be de-identified in the final dissertation.
18. HOW WILL THE DATA BE RECORDED AND STORED? WHO WILL HAVE ACCESS TO THE DATA? WHERE WILL IT BE STORED? ALL DATA MUST BE KEPT FOR A MINIMUM OF THREE YEARS.
The focus group/interview data will be recorded and transcripts will be prepared. All transcripts, documents, and recordings will be stored in a locked file cabinet, and will be properly destroyed after five years.