December 2018

The Effect of Instructors Training on Technology Adoption, Course Design, and Student Experiences: A Multiple Case Study of Training Based on TPACK or Quality Matters

Yvette Aqui

THE EFFECT OF INSTRUCTORS TRAINING ON TECHNOLOGY ADOPTION, COURSE DESIGN, AND STUDENT EXPERIENCES: A MULTIPLE CASE STUDY OF TRAINING BASED ON TPACK OR QUALITY MATTERS

By

Yvette Aqui

Bachelor of Science – Psychology
University of Hawaii at Manoa
1997

Master of Science – Educational Psychology
University of Nevada, Las Vegas
2002

A dissertation submitted in partial fulfillment
of the requirements for the

Doctor of Philosophy – Learning and Technology

Department of Educational Psychology and Higher Education
College of Education
The Graduate College

University of Nevada, Las Vegas
December 2018

UNLV | GRADUATE COLLEGE

Dissertation Approval

The Graduate College
The University of Nevada, Las Vegas

October 25, 2018

This dissertation prepared by

Yvette Aqui

entitled

The Effect of Instructors Training on Technology Adoption, Course Design, and Student Experiences: A Multiple Case Study of Training Based on Tpack or Quality Matters

is approved in partial fulfillment of the requirements for the degree of

Doctor of Philosophy – Learning and Technology
Department of Educational Psychology and Higher Education

E. Michael Nussbaum, Ph.D.
Examination Committee Chair

Kathryn Hausbeck Korgan, Ph.D.
Graduate College Interim Dean

LeAnn Putney, Ph.D.
Examination Committee Co-Chair

Matthew Bernacki, Ph.D.
Examination Committee Member

Denise Tillery, Ph.D.
Graduate College Faculty Representative

Abstract

The use of a Learning Management System (LMS) such as Blackboard Learn (Blackboard Learn, 2009) is a ubiquitous feature of the undergraduate experience. Despite its rapid increase in popularity and student demand for anytime, anywhere access to course materials, adoption of the LMS is slow and uneven. Some instructors also do not take advantage of some of the interactive tools in the LMS because it is complex in nature or they are unaware of the pedagogical affordances of the technology.

The purpose of this study was to explore the best ways to train faculty on how to use the LMS. This multiple case study examined different training methods based on Quality Matters (QM) and Technology Pedagogical Content Knowledge (TPACK) and its impact on tool adoption and use, course design choices, and instructors' self-beliefs in the efficacy to teach with technology.

It was discovered that the use of authentic examples in training and levels of experience had various impact on design and LMS tool selection and use. While TPACK trained instructors increased comfort levels with the technology in the participants, QM trained instructors were able to refine their use of the technology.

Acknowledgements

Without the guidance and support of my committee, friends, family, and the faculty who took the time to participate in this study, this dissertation would not have come to fruition.

First of all, I would like to express my sincerest gratitude to Dr. Matthew Bernacki, whose excellent guidance, patience, persistence, and encouragement was the push I needed to overcome some of the challenges I encountered throughout this study. I am indebted to his willingness to take the time meticulously go over *many* iterations of my dissertation since its inception. His feedback and constructive criticism guided me in the right direction when I veered off path.

I would also like to thank my advisors, Dr. E. Michael Nussbaum and Dr. LeAnn Putney who both have been here since I started my graduate studies, and my final committee member, Dr. Denise Tillery, for your guidance and encouragement.

Dr. Nussbaum's guidance and support on this endeavor was invaluable. He also introduced me to the Learning Management System (LMS) when he entrusted me with the task to co-develop his online course. This was a stepping stone to my career as an LMS administrator as well as an online instructor.

I am grateful not only for Dr. LeAnn Putney's qualitative expertise, which allowed me to complete this study, but also for her continuous support over the years. From my master's degree to my doctoral studies, her guidance and encouragement have been instrumental in my academic pursuits.

Last but not least, I would like to thank the faculty who took the time out to participate in this study.

Dedication

This dissertation is dedicated to my family. To my mother, Gloria Aqui, for your unwavering support and understanding during my rough patches. To my brother, Jason, for your encouragement and belief in me to accomplish what, at times, seemed impossible.

Finally, I dedicate this work to the memory of my late father, Melvin, who, along with my mother, instilled in us the value of hard work and persistence. I wish he were here to help us celebrate this momentous occasion. What a party it would be!

Table of Contents

List of Figures

Chapter 1

Introduction

The use of a Learning Management Systems (LMS), such as Blackboard Learn (Blackboard Learn, 2009) is a ubiquitous feature of the undergraduate experience. In addition to being used to deliver fully online courses, over 80% of faculty use an LMS to also supplement their face-to-face courses (Morgan, 2003). LMSs provide a cost-effective (Green, 2010), convenient system for instructors to host course content (Spector, 2013) and meet student demand for access to their course materials via mobile devices so they can learn from anywhere and at any time (Green, 2014). However, although technology advances at such a rapid pace and the demand from students increase, technology adoption in schools does not occur at the same rate (Annan, 2008; Kagima & Hasafus, 2001; Leh, 2005; Ping Lim, Zhao, Tondeur, Ching Sing, & Ching-Chung, 2013). Some barriers to consistent (and consistently effective) adoption include technical support from the institution, the technical skills and pedagogical knowledge of the faculty member, and time to design and manage LMS course sites (Annan, 2008; Green, 2014; Kagima & Hasafus, 2001).

Learning Management Systems (LMS) Adoption

LMS technology is characterized by uneven adoption and use (Halawi & McCarthy, 2007; Koszalka & Ganesan, 2004; Malikowski, 2010-2011). Some faculty are slow to take advantage of its affordances, and others are willing to adopt the technology but struggle to employ the technology in a way that promotes learning (Malikowski, Thompson, & Thies, 2007). Furthermore, while the use of an LMS can also provide instructors with interactive tools

to help enhance learning (Kong, 2014; Koszalka & Ganesan, 2004; Morgan, 2003) and can make accessing course materials more convenient (Spector, 2013), the design of the technology poses some challenges that can influence the quality of learning it supports.

The complex nature of technology can be an overwhelming obstacle for effective educational technology integration (Annan, 2008; Kagima & Hasafus, 2001; Ping Lim et al., 2013). Instructors can get inundated with technical problems when attempting to use an LMS, often derailing them even before they begin to learn to use the LMS's tools. In addition to a plethora of LMS tools available, redundancies in the LMS can make a simple task, such as uploading course materials, even more complicated by providing the user with several options to accomplish this. These frustrating or negative experiences can affect technology diffusion (Annan, 2008; Kagima & Hasafus, 2001; Rogers, 1995) which can result in two scenarios: 1) extremely rudimentary use of the technology and/or 2) avoiding the technology altogether.

Some common patterns can be seen in the way instructors utilize some but not all of LMS's features. Some instructors primarily use the LMS as a file repository; others use it as a portal for assigning grades (Koszalka & Ganesan, 2004; Malikowski et al., 2007; Morgan, 2003; Ping Lim et al., 2013). These approaches provide a convenience to students, whose primary needs are access to course resources (e.g., syllabus, course materials, performance feedback, and grades). However, when student demands drive LMS use patterns, instructors do not take full advantage of the interactive features or assessment tools available in an LMS that can improve students' learning.

The central issue in instructors' underutilization of an otherwise powerful technology is the instructors' inability to see the link between the LMS's technological affordances and their course's learning objectives (Kagima & Hasafus, 2001; Koszalka & Ganesan, 2004; Malikowski,

2010-2011; Mishra & Koehler, 2006). Identifying pedagogical affordances in relation to teaching and technology is a critical factor for effectively implementing technology into teaching (Mishra & Koehler, 2006). For an LMS, instructors need to consider how to organize the materials they provide, and to make informed decisions regarding when the technology is likely to help or hinder the accomplishing of learning goals (Annan, 2008; Caplow, 2006; Kagima & Hasafus, 2001; Malikowski, 2010-2011). These tasks present a challenge to a novice user of the technology. Even the rudimentary use of an LMS requires instructional design knowledge since organization and ease of use are important factors that impact students' online learning experiences (Katz, 2002; King, 2002). When uploading a syllabus or course readings, most instructors are uncertain about how to best organize their course materials (Caplow, 2006).

Once instructors are confident in the administration of their courses in an LMS, raising pedagogical awareness towards the technology is also imperative (Bennett & Bennett, 2003; Malikowski, 2010-2011). While some instructors may be willing to test out interactive LMS features, if they are not convinced that the technology can improve efficiency or provide pedagogical support, they are reluctant to adopt the technology and unwilling to invest time to learn how to use it (Bennett & Bennett, 2003; Kagima & Hasafus, 2001; Malikowski, 2010-2011). For example, an instructor may utilize online discussions during one semester in lieu of (or to expand upon) their in-class discussions. However, if the online discussions do not yield equivalent results as in-class discussions, the instructors may abandon the tool (Malikowski, 2010-2011). The value of the tool is defunct due to poor design, implementation, and misalignment of the activity with learning goals or objectives (Mazzolini, 2007; Rovai, 2007).

The question, then, becomes how can we help instructors get past technical challenges and inform their pedagogical choices so that they can more extensively and effectively employ

LMS technology in their teaching? I propose that instructors' negative experiences and history of ineffective use of an LMS can be mitigated through a comprehensive LMS training.

Professional Development/Training

The training program should be designed to help instructors develop both their technical and instructional design skills (Annan, 2008; Kagima & Hasafus, 2001; Mishra & Koehler, 2006). Program features should be tailored to increase faculty members' motivation to use an LMS by building their confidence with the technology through technical skills training as well as pedagogical training (Butler & Sellbom, 2002; Davis & Benson, 2012; Haviland, Turley, & Shin, 2011). It should also employ techniques that demonstrate pedagogical affordances of the LMS tools (Halawi & McCarthy, 2007; Mishra & Koehler, 2006; Ping Lim et al., 2013). Lastly, the program should facilitate activities that are more likely to produce transfer of training concepts to courses (Bartlett & Rappaport, 2009).

Through the development of both technical and pedagogical skills, faculty can learn how to efficiently and effectively utilize the LMS. Using training techniques to highlight the pedagogical value of an LMS tool (Bennett & Bennett, 2003) increase technical and pedagogical competencies (Keengwe, Kidd, & Kyei-Blankson, 2009; Kozalka & Ganesan, 2004), and providing instructors with a student perspective in an LMS (Caplow, 2006) can help alleviate the persistent problem that exists in technology adoption.

One factor that motivates faculty to adopt technology is recognizing the tool's educational value (Bennett & Bennett, 2003; Butler & Sellbom, 2002; Halawi & McCarthy, 2007; Schrum, 1999; Spotts & Bowman, 1993). A training program that successfully endorses

this feature of an LMS can serve as a catalyst for change in stage one of technology adoption: acceptance (Bennett & Bennett, 2003; Kagima & Hasafus, 2001). Through modeling and collective discussions, faculty will be able to see how others are utilizing the tools in ways that support similar learning objectives and produce positive student outcomes (Keengwe et al., 2009; Spotts & Bowman, 1993). By emphasizing authentic use of the technology within their discipline, the training should elicit long-term effects (Davis & Benson, 2006; Haviland et al., 2011).

Another goal of professional development programs should be to help cultivate instructors' technical proficiencies with the LMS. This can be achieved through technical guides (Jacobsen, 1998), live demonstrations (Yilmazel-Sahin & Oxford, 2010), and sufficient opportunities for guided hands-on practice (Johnson, Wisniewski, Kuhlemeyer, Isaacs, & Krzykowski, 2012; Keengwe et al., 2009). The latter, in addition to providing technical support beyond training, is crucial to building technical confidence in faculty (Bennett & Bennet, 2003; Perreault, Waldman, Alexander, & Zhao, 2002). This, in turn, can lead to the willingness to try out new tools.

In addition to having the technical aptitude of *how* to use an LMS, instructors must also be equipped with the pedagogical abilities to determine *when* to appropriately integrate the tools with their lessons (Mishra & Koehler, 2006; Yilmazel-Sahin & Oxford, 2010). Therefore, activities that support the development of this skill are also vital. Such activities will allow the faculty to determine whether or not the tool would be useful for students in accomplishing their learning objectives. It is important that instructors recognize the pedagogical affordances *and* limitations of the tools as well in order to effectively integrate technology into their teaching (Mishra & Koehler, 2006). For example, can the technology help them present a concept in a

clear and concise manner or will the technology just make it more complicated – resulting in a frustrated learning experience?

Instructors must also be given the opportunity to experience what it is like to be in an online environment as a student. By navigating through a sample course (Tabata & Johnsrud, 2008), the faculty will be exposed to an LMS as a student. This perspective, contrary to one's own, is an important aspect to consider when designing an online course (Caplow, 2006). Through this practice, the instructor will be able to determine whether or not their courses promote interaction, are easy to navigate, and instructions are clear and concise. All of these are factors that can make or break the students' online learning experience (Katz, 2002; King 2002).

Designing Training

Designing effective training programs to alleviate these concerns can also be a challenging task. However, in order for it to be effective, these programs must take into consideration the needs of the faculty. A vast array of professional development models are available to reference when designing professional development programs for instructors learning how to teach using an LMS (Hinson & Bordelon, 2004; Irani & Telg, 2007; Johnson et al., 2012; Koh & Divaharan, 2011; Schrum, 1999; Yilmazel-Sahin & Oxford, 2010). The principles behind each model vary to some degree. Some models are focused on the activities that occur in training that will promote long-term effects after training (Hinson & Bordelon, 2004). Others are heavily dependent on developing one skill at a time – technical or pedagogical (Irani & Telg, 2007; Yilmazel-Sahin & Oxford, 2010). Few have combined techniques to develop both technical and pedagogical skill at the same time (Johnson et al., 2012; Koh & Divaharan, 2011).

TPACK and Quality Matters Training

Having a vast array of training models to use as a guideline can make it difficult to identify the best one. Traditionally, the evaluations of these models have been limited to examining the effects of a single model of training (Hinson & Bordelon, 2004, Irani & Telg, 2007). The goal of this study was to compare two training programs based on different theoretical frameworks – Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006) and Quality Matters (QM) (Quality Matters, 2014). I will align instruction around improving instructors' capacities, versus an improved user experience, respectively.

These two main approaches are pervasive in the literature and have different implications for approaches to training. The TPACK approach (Mishra & Koehler, 2006) focuses on instructors' attitudes and skills. The primary goal is to design training that will build upon the technical, content, and pedagogical knowledge necessary to successfully integrate technology into teaching. In addition, it is also intended to acquire buy-in from the faculty through acknowledging the educational value of the tool(s). It fails, however, to take into consideration the students' experience when utilizing the LMS tools.

In contrast to the TPACK model, the QM training relies heavily on designing courses with a student's experience in mind. Quality Matters currently utilizes a peer review approach to producing quality online and blended courses (Quality Matters, 2014). While traditionally used to evaluate courses, in this study I designed training based on these standards. The focus was on course design, technical considerations, and pedagogical knowledge to provide students with a positive experience in the LMS (Quality Matters, 2014).

The QM and TPACK frameworks were utilized to produce quality LMS training programs. In this multiple case study I intended to test the effects of each from both an instructor and user/student experience perspective, and explored the following research questions:

1. How do trainings based on TPACK or Quality Matters frameworks influence instructors': (a) technology adoption, (b) course design choices, and (c) self-beliefs about efficacy to teach with technology?
2. How does the training an instructor receives influence the students' learning experience?

In the following section, I examined the two prevailing frameworks for supporting faculty use of LMS technology, the TPACK model (Mishra & Kohler, 2006) and design based on Quality Matters standards. I compare the assumptions of each model, the impact of these assumptions on training, and how these assumptions affect instructors' successful integration of technology into their teaching and students' success, measured by factors such as retention rates and performance in online or hybrid courses. I also explored the professional development literature to guide the design of training.

Chapter 2

Literature Review

Establishing effective professional development programs can be a challenging task. However, if designed well, a program can help overcome some of the barriers to technology adoption and effective use of LMS tools. In this chapter I will examine several learning theories and how they are applied to professional development programs, research examining features that make these programs successful, methods used to evaluate professional development, and then focus specifically on professional development programs for improving faculty's self-efficacy towards technology, course design, and student outcomes. This includes training based on the Technological Pedagogical Content Knowledge framework (TPACK) (Mishra & Koehler, 2006) and the Quality Matters (QM) framework (Quality Matters, 2014).

Overview of Learning Theories that Inform Professional Development Design

Adult learning can be a complex undertaking, especially since individuals bring prior knowledge or experiences to all learning situations. This section examines different learning theories that exist to explain how individuals best learn. These theoretical frameworks are important for shaping instruction. In addition to explaining general learning theories, I also looked at specific adult learning theories.

Constructivism. Constructivists see the learner as taking an active role in the learning process. Rather than simply acquiring knowledge, learners actively construct knowledge through interactions with the information presented to them. Two distinct types of constructivism include cognitive constructivism and social constructivism. Piaget's (1936) cognitive constructivism view of learning sees it situated and dependent on how a learner interacts or interprets the

information presented. This can be done through what is termed equilibrium (Eggen & Kauchak, 2012; Piaget, 1936). Learners function on conflict with their current state of knowledge; which often occurs through interactions with their environment. Learning occurs when this interaction forces the learner to accommodate existing knowledge with this new or conflicting knowledge.

With social constructivism, learning is influenced by the social interactions that occur in one's learning environment. One of the more notable contributors to this view of learning is Vygotsky. He saw learning as socio-cultural in nature. Instruction based on the constructivist model is learner centered (Ozkal, Tekkaya, Cakiroglu, & Sungur, 2009; Vygotsky, 1978). In this perspective, learners who view their learning environment through a constructivist lens believed that their knowledge is evolving. Therefore, they are more likely to adopt meaningful learning approaches. Deeper learning occurs because the learner feels more in control of their learning in science education.

In contrast to behaviorism, which emphasizes observable, external behaviors, constructivism takes a more cognitive and social approach to learning. The goal is to modify mental states as a means of learning and seeing how learners socially interact with humans as well as materialistic items. Mayer (1996) views the instructor as guides in constructivist classrooms. Instead of being the source of the knowledge, teachers focus on the process by which learning occurs.

Transformative Learning. Mezirow's (1996) transformative learning theory explains the adult learning process as "using prior interpretation to construe a new or revised interpretation of the meaning of one's experience in order to guide future action" (p. 162). This process is one theory of adult learning that uses past experiences as a frame of reference. This prior experience or knowledge influences an individual's thought processes, beliefs, and actions

in any learning situation. The transformative learning process relies on a few important factors in order to elicit change: a) creating opportunities for learners within and outside of the learning environment to apply new concepts, b) critical reflection, and c) recognizing that one's beliefs, attitudes, and relationships with others in the learning environment (Taylor, 2008). Individuals are designed to act, think, or feel in certain situations based on cultural and social codes of conduct. All of these behaviors, thoughts, and/or feelings can be transformed through critical reflection.

According to the transformative learning theory, rejection of an idea or phenomenon usually occurs when it does not fit our current schema that has been constructed over time. Thus, the three processes of learning based on the transformative theory are: 1) learning to establish new points of view, 2) transforming an existing point of view, and 3) transformation of our habit of mind through awareness and critical reflection (Mezirow, 1996). Learners must be able not only to acquire new knowledge but be able to use it as well. Mezirow (1996) stresses the need to empower learners to think; they need to understand and manipulate information, not just obtain it.

The following instructional models have been examined that utilize various techniques that leverage users' background knowledge and work as change agents to alter existing attitudes or misconceptions. The instructional models that were examined are problem-based learning and cooperative learning. I will compare and contrast these models based on the following criteria: 1) underlying principles of learning, 2) the role of the learner and educator, and 3) how is the learner motivated to learn.

Problem Based Learning. Problem based learning (PBL) is a constructivist approach to instruction that uses critical analytical skills as learning strategies. Furthermore, it encourages

collaboration between learners (Hernandez-Encuentra & Sanchez-Carbonell, 2005). The use of authentic learning situations and active participation of learners is the driving force behind this practice. The key here is learning by experience. The learners can work collaboratively in groups to learn what they need to know and the instructor takes on the role of facilitator. This approach inherently utilizes the social aspect of learning. In these groups, the students interact with one another as well as objects that they use as resources.

The goals or principles behind PBL are to "help [learners] 1) construct an extensive, yet flexible, knowledge base, 2) develop effective problem-solving skills, 3) develop self-directed, life learning skills, 4) become effective collaborators, and 5) become intrinsically motivated to learn" (Hmelo-Silver, 2004, p. 240). Research has shown that the use of PBL in higher education provides a positive example of a type of learning structure that promotes lifelong learning (Hernandez-Encuentra & Sanchez-Carbonell, 2005). This study demonstrated that the instruction based on a PBL theoretical framework relies on the students' background experiences and knowledge through PBL. This type of instruction is important in professional development programs and/or workshops as the participants usually have varying degrees of technical experiences and knowledge bases.

PBL learning groups vs. traditional (direct) instruction groups have the ability to better integrate new concepts with knowledge that had been activated (Capon & Kuhn, 2004). This feature has implications for the positive effect of PBL on transfer of knowledge (Capon & Kuhn, 2004; Derry, Hmelo-Silver, Nagarajan, Chernobilsky, & Beitzel, 2006). It is plausible that students exposed to PBL learning develop methods that allow them to reflect on knowledge and restructure their knowledge base in order to accommodate new concepts. This reflection would be useful in teaching faculty how to use new technology in ways that they never considered.

Cooperative Learning. Cooperative learning is a social constructivist type of instruction that involves the use of small groups of learners. It is based on the social interdependence theory (Deutsch, 1949; Johnson & Johnson, 2008; Johnson, Johnson, & Smith, 2013). Social interdependence occurs when achieving each individual's goal is influenced by others' actions (Eggen & Kauchak, 2012; Johnson & Johnson, 2008). In cooperative learning, students work towards meeting specific learning goals as well as social interaction objectives (Eggen & Kauchak, 2012; Johnson & Johnson, 2008). The construction of knowledge, as with PBL, is reliant on social interactions. These social interactions allow learners to produce better understanding in learning than they would as individual learners. The emphases of cooperative learning are in working collaboratively, taking ownership or responsibility for one's own understanding, and learners depending on each other to solve problems.

As with all learning situations, cooperative learning's success is dependent on the right conditions (Johnson & Johnson, 2008; Shaaban, 2006). When these conditions are met, Johnson, Johnson, & Smith (2013) found that it will benefit students and faculty in higher education settings. The conditions, previously mentioned, must be planned very carefully. Learners should be positively interdependent, accountable for pulling their own weight, be supportive of each other, encouraged to use their social skills appropriately, and be metacognitively aware of their progress. Not only do these factors provide for richer learning environments, but these observed interactions between students also helps instructors monitor the progress of groups and intervene when necessary (Johnson et al., 2013).

These learning theories have also been used as frameworks for designing faculty development programs in higher education. The challenges, as with any adult learning situation, are to identify the types of knowledge an individual brings with them to training and

overcoming any barriers to learning that may existed based on their prior knowledge. Therefore, it is important to design training programs that are conducive to learning and promotes transferring this knowledge into practice.

Design Principles for Professional Development

While higher education institutions have implemented faculty LMS training programs, it is unclear if one training approach or model is more effective than another. In fact, a recent survey administered to higher education faculty found that a large percentage of faculty are not satisfied with their existing training or support structures at their institutions (Green, 2014). Since inadequate support and training has been identified as one factor attributed to low levels of technology adoption (Annan, 2008; Green, 2014; Kagima & Hasafus, 2001), it is important to develop training that will take into consideration the instructors' needs. Examining professional development programs that facilitate developing teacher knowledge is the first step in accomplishing this. Such examination will help identify which components or features of training are most beneficial to instructors.

The professional development literature is quite extensive (Gast & Van Der Veen, 2017; Kennedy, 2016; Mohr & Shelton, 2017; Vangrieken, Meredith, Packer, & Kyndt, 2017). Several models exist to guide training programs, and previous research has identified both structural and core components to consider when designing effective professional development programs (Penuel, Fishman, Yamaguchi, & Gallagher, 2007; Garet, Porter, Desimone, Birman, & Yoon, 2001). Within the professional development literature, a few of these components were found to

have a positive impact on instructors' knowledge and practices. The structural components included forms or types of activities (workshops, study groups, etc.), collective participation (participation as a cohort that has shared goals and curriculum, for example), and the duration of the program. Core components included focusing on content knowledge (emphasis on content with each training activity), opportunities for active learning (hands on activities), and coherence with other activities (how professional development is related to their own practice) (Garet et al., 2001).

Research suggests that, of these components, duration (Garet et al., 2001; Haviland, Turley, & Shin, 2011; Irani & Telg, 2001; Spector, 2013), topic (Backer, 2001; Haviland et al., 2011; Zelin II & Baird, 2011), goals (Backer, 2001; Davis & Benson, 2012; Haviland et al., 2011), collaboration (Leh, 2005; Penuel et al., 2007; Spector, 2013; Zelin & Baird, 2011), and hands-on practice (Backer, 2001; Davis & Benson, 2012; Garet et al., 2001; Leh, 2005; Zelin & Baird, 2011) are all important features of effective professional development programs. These factors influence not only instructors' knowledge, but also the likelihood in which they incorporate what they learned into their own teaching practices (Davis & Benson, 2012; Irani & Telg, 2001; Leh, 2005).

Duration. While longer and more intensive professional development programs have been found to allow for more in depth collaboration amongst participants and promotes deeper learning (Garet et al., 2001; Haviland et al., 2011), other departmental obligations make this format difficult to maintain retention (Backer, 2001; Spector, 2013). Attendance has been found to drop off because faculty are unable to commit the time to long-standing workshops (Backer, 2001; Spector, 2013). Irani and Telg (2001) found that offering a combination of formal, informal, self-paced, and short training programs allow faculty to select the type of training that

works best for them. Shorter workshops are more appealing to faculty with strict time constraints and longer workshops can be reserved for those who have appropriate release times.

Due to constraints of this study, short, segmented workshops were not offered. Instead, I offered two workshops – each scheduled to last no more than2 hours, depending on the topic and participant questions. With only two workshops to attend, I hoped to have had high retention rates amongst the participants.

Topic. Topic specific training programs allow participants to focus on one piece of technology or a specific tool at one given time. When tasked with learning several computer applications or technology tools in a lengthy workshop, users lose interest because of a lack of focus and confusion (Backer, 2001). Instructors have shown an improvement in technology skills when they are only required to focus on one piece of technology or tool at a time (Backer, 2001; Haviland et al., 2011). Focusing on a specific topic will also allow the trainer to manage the workshops better as attendees may have varying degrees of technical experience or knowledge (Zelin & Baird, 2011).

To take advantage of the benefits of topic focused professional development, workshops in this study were limited to a specific tools or tasks. For example, one workshop addressed how to organize the course materials and the other covered tools that were grouped by tool type (e.g. communication tools, assessments, etc.). An attempt was made to keep the instructors motivated by not inundating them with too many different tasks to accomplish at any given time.

Goals, hands-on practice, and personalization. Having clear and obtainable goals in any educational setting, including faculty training, is important (Backer, 2001; Davis & Benson, 2012; Haviland et al., 2011). If the instructors have something tangible to work towards (such as an end product) and the workshop activities lead up to this end product, they are more likely to

remain engaged during the session. This practice also ties in with other important factors – practice and personalization. While general goals can be established, faculty are more likely to remain invested in training when they are able to apply what they learned to a task specific to their own curriculum (Hinson & LaPrairie, 2005). This technique also allows instructors to develop their technical and pedagogical skills in personally meaningful ways.

For this study, I explicitly stated descriptions and objectives of each workshop. By providing clear descriptions and objectives, instructors knew what they could expect to learn during a particular training session. This specificity also helped participants decide whether or not attending the session would be useful to them. In addition to forming clear goals for each workshop, participants were told in advance what they should expect to gain at the end of the training. Workshop activities were associated with these specific goals.

Collaboration. Working collaboratively during workshops helps promote pedagogical awareness of the technology and provides participants with a strong departmental support system that could extend beyond training. These are two factors that have been found to a) help faculty overcome the resistance to utilize technology, b) produce long term changes to courses, and c) produces long term changes in attitudes towards technology and/or change (Bennet & Bennet, 2003; Leh, 2005; Malikowski, 2010-2011; Spector, 2013; Zelin & Baird, 2011). Collaboration allows the instructors the time to share and reflect on pedagogical uses of the technology (Leh, 2005; Spector, 2013; Zelin & Baird, 2011). This strategy has been found to be most effective when training is domain specific since instructors can exchange ideas pertaining to their specific discipline (Zelin & Baird, 2011).

In this study, I worked with a single department and focused on instructors who were teaching the English Composition courses offered at the university. The reason this cohort of

instructors was selected was to have participants work collaboratively by sharing ideas on the same topic. These collaborative features would include small and whole class discussions as well as group activities. Instructors were also encouraged to exchange ideas through open discussions both during and outside of the workshop settings.

Evaluating Professional Development Programs

To date, a majority of the research that involves evaluating the effectiveness of professional development programs has been limited to self-report questionnaires and self-efficacy scales (Kirkwood & Price, 2013; Kong, 2014). While this provides insight to satisfaction with and attitudinal shifts as a result of training, it neglects to demonstrate what happens after training. Instructors may have increased their technological confidence levels through training (Rienties, Brouwer, & Lygo-Baker, 2013); however, this is not always an indication that they are able to implement the tools effectively (Tomte, Enochsson, Buskqvist, & Karstein, 2015). Ensuring that a training program produces successful results must extend beyond these satisfaction and self-efficacy levels. Additional research is needed in the professional development realm that examines changes to courses as well as its impact on student outcomes.

For this study, I conducted various small group discussions, which was dictated by the workshop size. Despite having only one or two attendees per workshop, I was able to incorporate either peer to peer and/or instructor led discussions. For the workshops where there were only two attendees, both peer to peer and instructor-learner interactions were utilized to discuss and/or exchange ideas (Lang, Craig, & Casey, 2017). For those workshops that consisted of only one attendee, instructor-led discussions took place. Both methods were used to provide attendees

with an opportunity to bridge the gap between content, pedagogical, and content knowledge by combining both of our areas of expertise (Mishra & Koehler, 2006).

An attempt was made to adhere to other design recommendations that were derived from research on professional development, and train teachers according to the two predominant theoretical frameworks for course design – TPACK and Quality Matters. While there is some conceptual overlap with these frameworks, understanding the differences in their assumptions and effects on instructors and student outcomes will guide the design of effective training to help instructors use LMS technology.

Technological Pedagogical Content Knowledge (TPACK)

The technological pedagogical content knowledge (TPACK) framework has been used as a foundation for teacher development (Mishra & Koehler, 2006). The knowledge required to teach a particular subject, manage classrooms, and plan and implement lessons to facilitate learning can be quite extensive. Teachers not only are required to master the content that they are teaching, but they should know how to present materials in ways that are conducive to learning.

TPACK was developed based on Shulman's (1987) theory of types of teacher knowledge. Shulman (1987) argued that effective teaching requires an individual to develop two types of knowledge that are intertwined – content knowledge and pedagogical knowledge. Prior to this discovery, researchers and practitioners saw these two types of knowledge as separate entities. Content knowledge referred to as knowledge of the subject. Pedagogical knowledge is knowing how to teach and understanding the learning process. A combination of these two knowledge types, pedagogical content knowledge, encompasses being able to organize, present,

and facilitate learning on a topic, problem or issue within a specific domain. It also involves knowledge of how to respond to common student misconceptions and to handle classroom situations to promote learning (Shulman, 1987).

While the digital age has provided teachers and students with several powerful educational technology tools to help enhance teaching and learning, it added another dimension to teacher knowledge types. Such tools include learning management systems (e.g. Blackboard, Moodle), software applications (e.g. PowerPoint, video creation/editing), and other interactive web based tools (e.g. online games, discussion forums). While these tools can help illustrate teaching concepts in more sophisticated ways and provide more convenient ways to disseminate course materials, knowing how to effectively use these tools adds another layer of complexity to teaching.

Because of this trend, Mishra and Koehler (2006) expanded upon Shulman's (1987) conceptualization to include technology through the establishment of the Technological Pedagogical Content Knowledge theoretical framework. TPACK serves as a means for understanding teacher knowledge and its implications within educational technology research (Mishra & Koehler, 2006). The TPACK framework has also been used to help design training in ways that will promote the development of teachers' knowledge in three main areas – technology, pedagogy, and content. In addition to these three areas, TPACK also emphasizes the importance of the interactions between each of these areas.

Figure 1 illustrates the three forms of knowledge that TPACK encompasses - content

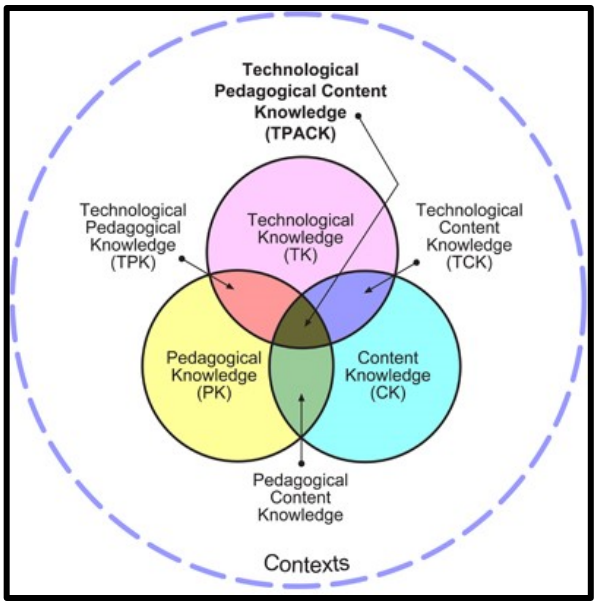


Figure 1. TPACK. The components of
Technological Pedagogical Content Knowledge

(CK), pedagogy (PK), and technology (TK) - and the other knowledge types that exist at the intersections between them (Mishra & Koehler, 2006). Additional types of knowledge to consider are Technological Content Knowledge (TCK) which is an intersection between TK and CK; Technological Pedagogical Knowledge which is an intersection between TK and PK; Pedagogical Content Knowledge (PCK) which is an intersection between PK and CK; and finally, an interaction of all three types of knowledge (TPACK).

Content knowledge (CK) is knowledge of the subject being taught. Pedagogical knowledge (PK) is knowing how to teach and understanding the learning process. Technological Knowledge (TK) embodies being able to think about and work with technology, tools, and resources. It allows an individual to understand how to apply technology in everyday life and the ability to recognize technological advantages and disadvantages.

The first intersection of these knowledge types is Pedagogical Content Knowledge (PCK) - a combination of pedagogical and content knowledge. PCK recognizes the different types of knowledge needed by teachers to be effective instructors. It includes knowing how to organize, present, and facilitate learning on a topic, problem, or issue within a specific content area. The second intersect is Technological Content Knowledge (TCK) - understanding how technology and the effective presentation and learning of content can affect and constrain each other. Teachers should be able to identify which technologies are complimentary to their subject matter and how the content might guide the choice of technologies.

The third intersect is Technological Pedagogical Knowledge (TPK) - understanding how technology used in particular ways can impact teaching and learning. Being able to identify pedagogical affordances and constraints of available technological tools is crucial. Finally, Technological Pedagogical Content Knowledge (TPACK) embodies the type of knowledge one must possess in order to use technology effectively in learning situations. It includes making strategic decisions on when to use technology in order to take advantage of its affordances.

TPACK allows instructors to appropriately select technologies that are available to them, not just use technology just because it exists. Technology is used in the service of facilitating learning of subject-matter concepts. The mastery of TPACK requires a form of expertise that is different from a content expert, a technology expert, and a pedagogical expert (Mishra & Koehler, 2006). Having this type of knowledge will provide teachers with the ability to make appropriate decisions about which tools to use in order to facilitate learning.

For example, with English composition and the use of LMS tools, a mastery of TPACK would allow instructors to carefully select and use LMS tools that will help them achieve their course objectives or goals. They would be able to answer questions such as: Can such activities

such as asynchronous online discussions help enhance students' critical thinking and writing skills? If so, what discussion questions should they use? How can they facilitate interactivity through these discussions? In addition to these questions, they will have the knowledge to set up, manage, and assess the discussions in their LMS course. Part of this assessment would include recognizing whether or not the use of the new tool or method was conducive to learning or if it was hindering it. Allowing them to make adjustments as necessary.

A number of studies (Agyei & Keengwe, 2014; Alsofyani, Aris, Eynon, & Majid, 2012; Mishra & Koehler, 2006; Tømte, Enochsson, Buskqvist, & Kårstein, 2015) have examined training programs' impact on teachers' TPACK levels and have found favorable results. This body of research has found that TPACK focused professional development increased teachers' perceived TPACK levels, their technological confidence, and improved their pedagogical considerations when integrating technology into teaching. However, the impact TPACK has on higher education faculty or student outcomes has not yet been fully explored. An impact on future practices is a seldom researched outcome. In this study, I examine not only their self-beliefs and pedagogical considerations, but their design choices as well.

When K-12 teachers participate in TPACK professional development programs, it has also been found to increase the knowledge required to utilize educational technology in ways that meet their pedagogical goals (Mishra & Koehler, 2006; Tomte et al., 2015). As found in the professional development program literature, the transfer of knowledge into practice relies on collaboration and practice or active participant roles.

In addition to these two factors, TPACK training also must raise awareness of the pedagogical affordances of the technology and model the use of the technology within a content specific domain (Mishra & Koehler, 2006; Rienties et al., 2013; Tomte et al., 2015). In order to

elicit change in TPACK levels, teachers must be made aware of the pedagogical value of technology (Mishra & Koehler, 2006). Once acceptance is achieved, teachers are more likely to be interested in technology adoption because using the technology increases both their technical and pedagogical aptitude levels.

The TPACK survey (Schmidt, et al., 2009) has been the primary method used to assess faculty's self-efficacy in integrating technology into teaching. Typically administered both before and after training, means are compared to identify the impact training has on TPACK levels. The survey includes a set of questions related to the seven knowledge types in the TPACK framework. However, this study will utilize additional methods of data collection to get a better picture of how TPACK development influences curriculum changes and instructors' behaviors in an LMS.

The success or effectiveness of TPACK development has also been typically measured through the experiences of/changes in teachers (Mishra & Koehler, 2006; Rienties et al., 2013; Tomte et al., 2015). The literature does not include examining the effects of TPACK training on teachers' initial design choices or their redesign in response to student experience, nor the impact that TPACK trained teachers have on student outcomes. This study will address this gap in the TPACK literature.

Quality Matters

Another prevalent instructional design framework is Quality Matters (QM). QM is a fairly recent development that focuses on course design and organization, not implementation. The Quality Matters (QM) program was developed over the course of three years (2003-2006) to serve as a system to ensure quality in online or blended courses (Shattuck, 2007). It utilizes a

user experience approach to course design and includes a peer review process to evaluate the design and organization of these courses (Legon & Runyon, 2007). The Quality Matters process involves compiling a team of three certified QM reviewers (usually more seasoned faculty) who will work collaboratively with the instructor whose course is being reviewed. The reviewers use the QM Rubric as a guideline for this evaluation phase and then provide the instructor with feedback and recommendations for improving their courses.

Because the QM rubric used in the QM evaluation process undergoes regular reviews to keep the standards current and applicable to disciplines and various academic levels (Shattuck, Zimmerman, & Adair, 2014), a few iterations of the rubric have been initiated since its inception. At the time that this study was conducted, the 2011-2013 edition of the rubric (Appendix A) consisted of 42 review criteria that had been divided into eight major standards: 1) Course Overview and Introduction, 2) Learning Objectives, 3) Assessment and Measurement, 4) Instructional Materials, 5) Learner Interaction and Engagement, 6) Course Technology, 7) Learner Support, and 8) Accessibility.

These eight standards were selected based on the expertise of teams comprised of online instructors and instructional designers as well as from best practices standards established by various accrediting bodies and organizations (Quality Matters, 2014). These standards were also validated through an extensive literature review that focused on factors that increased learner satisfaction, engagement, and improved retention rates in online courses (Quality Matters, 2014). The eight Quality Matters standards are based on instructional design theories that help facilitate learning. These include Cognitive Load Theory (CLT) (Paas, Renkl, & Sweller, 2004; Sweller, 1999) and Generative Learning Theory (Wittrock, 1992; 1974).

The criteria for the QM standards guide instructors on how to apply course design elements to help reduce extraneous cognitive loads for students (Brunken, Steinbacher, Plass, & Leutner, 2002; Sweller, 1999; Van Merrienboer, Kirschner, & Kester, 2003), provide students with opportunities make connections between the content and activities (Ballenger, Templeton, & Thompson, 2018; Wichadee, 2018; Wittrock, 1974), and establish a sense of community through collaboration and increasing the instructor's presence in the online learning environment (Furnborough & Turman, 2009; Kear, Chetwynd, & Jefferis, 2014; Pollard, Minor, & Swanson, 2014).

Cognitive load theory research has shown that student performance can suffer when they either experience very low cognitive load or very high cognitive load (Paas, Renkl, & Sweller, 2004; Sweller, 1999). The latter has been found to be a problem in eLearning as the student faces multiple challenge at once. While they are trying to make sense of the concepts being taught, they also are tasked with trying to navigate and use the LMS or other technology. This can hinder meaningful learning because these simultaneous tasks are competing for cognitive resources (Paas, Renkl, & Sweller, 2004; Sweller, 1999). When students experience high cognitive load they can be overcome with anxiety or frustration. This can lead to the inability to continue on in the learning process (Lee & Choi, 2011; Tyler-Smith, 2006; Yorke, 2004). The goal of Quality Matters is to reduce this load during the learning process through various course design elements (Brunken, Steinbacher, Plass, & Leutner, 2002; Greer, Crutchfield, & Woods, 2013; Kalyuga, 2012; Paas, Renkl, & Sweller, 2004; Van Merrienboer, Kirschner, & Kester, 2003).

Another goal of the QM rubric is to utilize instructional design strategies that will enhance learning by connecting learning objectives with course content and activities. Wittrock's

(1974, 1990) Generative Learning Theory focuses on neural and cognitive processes that students employ to produce meaning and understanding from instruction. This model consists of four major processes: a) attention, b) motivation, c) knowledge and preconceptions and d) generation. In this model, the learner plays an active role in knowledge acquisition by generating relationships between concepts, prior learning, and new information (Wittrock, 1992). Since generative learning depends on how information is presented and how learners try to comprehend it, the goal of instruction is to create an environment in which students are guided to establish these relationships. Through this process, learning is more meaningful and keeps the students engaged.

Several of the QM standards help address the issue with extraneous cognitive load and help guide students through establishing meaningful connections via the following: a) providing the students with necessary information or skills they need to succeed in the course (QM Standard 1: Course Overview and Introduction), b) ensuring that learning objectives are aligned with activities in the course (QM Standard 2: Learning Objectives and QM Standard 3: Assessment and Measurement), c) providing students with only relevant and current course materials (QM Standard 4: Instructional Materials), d) providing students with ample opportunities of interaction with others and the content (QM Standard 5: Learner Interaction and Engagement), e) providing students with links to university resources that provides technical, accessibility, and academic support to ensure student success (QM Standard 7: Learner Support), and f) setting up courses so that they are easy to navigate and eliminate barriers that would prevent certain students from accessing the materials or activities (QM Standard 8: Accessibility).

Additional ways to promote meaningful learning through design include creating a sense of community in the online classroom through introductions and increasing instructor presence (QM Standard 1 and QM Standard 5). QM Standard 1: Course Overview and Introduction also requires instructors to not only introduce themselves to their students, but also asks the students to introduce themselves to the rest of the class. This technique is one step to developing an online community, increases instructor presence in the course, and allows for student-student and instructor-student interactions. These factors have been found to have a positive impact on students' experiences in online courses (Kear, Chetwynd, & Jefferis, 2014; Pollard, Minor, & Swanson, 2014; Sheridan & Kelly, 2010; Swan, 2001).

Additionally, Standard 5 can aid in keeping the students engaged in the course through instructor feedback. Standard 5 requires instructors to establish a clear plan for their feedback and response time (Furnborough & Turman, 2009; Ley & Gannon-Cook, 2014). Timely feedback and instructor's presence in a course has been found to reduce the number of dropouts in an online or hybrid course (Jaggars & Xu, 2016; Roulston, Pope, & deMarrais, 2018; Sancho-Vinuesa, Escudero-Viladoms, & Masia, 2013). Through their feedback, instructors also play an active role in guiding the students' learning through scaffolding (Wittrock, 1992; Wood, Bruner, & Ross, 1976).

QM Standard 6: Course Technology focuses on ensuring that instructors select appropriate LMS tools that aligns with their pedagogical goals and promotes active learning through interactions and engagement between participants and the content (Davis, Chen, Hauff, & Houben, 2018; Holmes & Prieto-Rodriguez, 2018; Pena-Shaff & Altman, 2015).

Several studies (Bogle, Cook, Day, & Swan, 2009; Klene, 2013; Ralston-Berg, 2014; Ralston-Berg & Nath, 2011) have also examined the validity of the QM standards based on

students' perceptions of which factors are associated with a quality online course. Since it was found that students value all of the QM criteria within the rubric, if a course meets QM standards it is likely to produce high levels of student satisfaction (Bogle et al., 2009; Ralston-Berg, 2011). The QM criteria's focus on generic pedagogical practices, however, might come at a disadvantage of less development of faculty's technical skills through QM training. The literature neglects to examine this impact on faculty.

While traditionally used to evaluate courses, many institutions are also beginning to use QM as a guide for developing courses and for faculty development. This study utilized the QM rubric as a framework for designing LMS training that was also focused on students' experiences. The QM Rubric was used to guide the instructors when making course design choices and tool selections. Instead of inundating the instructors with all 42 criteria, specific items were selected based on the tool being used (see Appendix I). For example, when creating a discussion, in addition to providing students with the discussion topic or question, instructors should also include: a) how it relates to the learning objectives to that unit (QM Standard 2: Learning Objectives), b) criteria on how the students will be evaluated (QM Standard 3: Assessment and Measurement), and c) where to find support for how to use the discussion board (QM Standard 7: Learner Support). As mentioned previously, having clear objectives and ensuring that the discussions (or other activities) are aligned with these objectives enhances instructional effectiveness, is good assessment practice, and allows the students to understand the connections between the content and the activities in the course (Reeves, 2006). Providing students with support resources can also help alleviate extraneous cognitive load if they run into technical issues with the discussion tool. This will permit students to focus on the learning task at hand.

The training model based on Quality Matters was also initially designed to incorporate the peer review process as well as integrate the recommended standards during each training session. For example, workshop participants would be tasked to review any changes made to one another's courses and provide feedback. QM training covered topics such as discussion boards, adding content in the LMS, and tests. Attendees were also equipped with information on how to use the QM standards as a guide for: 1) aligning online activities with course objectives and 2) organizing their content.

Quality Matters and TPACK

Aligning TPACK with the QM standards has been attempted, but no published results have validated these preliminary findings (Ward, 2012). Ward's (2012) alignment is illustrated in Figure 2. Ward discovered that the largest number of QM rubric standards fall into the

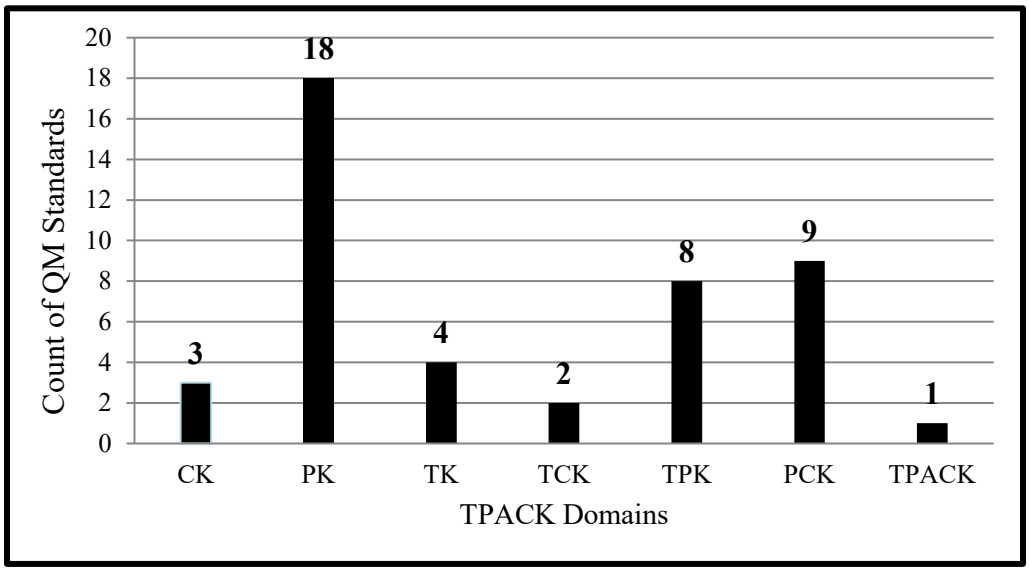


Figure 2. QM standards aligned with TPACK components

This figure illustrates how many QM standards are associated with each of the 7 TPACK domains – CK = Content Knowledge, PK = Pedagogical Knowledge, TK = Technical Knowledge, TCK = Technological Content Knowledge, TPK = Technological Pedagogical Knowledge, PCK = Pedagogical Content Knowledge, and TPACK = Technological Pedagogical Content Knowledge

Pedagogical Knowledge (PK) arena whereas only one standard can be associated with Technological Pedagogical Content Knowledge (TPACK). These preliminary results were used to guide a future, unpublished, study evaluating the impact of Quality Matters on instructors' TPACK development. This study intended to do the same by comparing pre- post- and delayed-post-training TPACK survey results with all participants.

Appendix A also illustrates the categorization of all QM rubric criteria with TPACK based on Ward's (2012) study. Because the study was conducted prior to changes made to the QM rubric, I categorized the additional QM criteria based on their descriptions. These modifications by the researcher are indicated with asterisks.

Limits to Current Understanding of TPACK and Quality Matters

The main purpose of this mixed methods multiple-case study was to compare two different training methods – one that is instructor centered (TPACK) and the other that will be user experience centered (Quality Matters). Additionally, further investigation of what happens after training could uncover how attending training can be beneficial to not only the training participants, but their students as well.

In addition to comparing these two different types of training methods, other goals of this study were to address unanswered questions in the TPACK and QM literature. First, the development of TPACK literature has primarily used the K-12 or pre-service teacher population. Not many studies have been conducted at the higher education level due to the diversity in this population. However, with the increasing demand of using an LMS to either deliver or supplement instruction in the higher education setting, it is important to examine TPACK development in this population as well.

Secondly, TPACK development research has, understandably, been focused on the teachers themselves and how they implement changes in their curriculum as a result of attending TPACK training. However, more research is needed to help understand how students benefit from learning in courses taught by instructors who completed TPACK training. Do courses taught by TPACK trained instructors increase student satisfaction with courses, retention rates, and/or performance?

Third, because the QM literature has only recently begun to emerge, the methodologies used to measure its impact on both faculty and students are limited. In a review of the research, Shattuck (2012) found that the research of the impact of Quality Matters on instructors has been reliant primarily on surveys. In this study, I analyzed course design changes as a marker of

instructors' pedagogical activities, providing a channel of behavioral data that supplements the self-reports researchers collect. By comparing courses before and after training, this study can bring to light the impact of training on course design decisions or changes. Open ended survey questions were also used to obtain a deeper understanding of why instructors made these changes to their courses.

Finally, the preliminary study that aligned TPACK with QM standards relied on instructors perceptions of which QM fell into each of the TPACK knowledge types. More research is needed to understand how Quality Matters aligns with TPACK and whether or not TPACK development can occur during training where TPACK is only implicitly taught. For example, will training based on QM result in increases for specific TPACK knowledge types? Since QM is focused on course design and the student's experience in an online course system, are instructors likely to increase their pedagogical and content knowledge versus their technological knowledge? By administering a TPACK survey to all participants in this study regardless of which training intervention they receive, this study can compare faculty responses to evaluate perceived levels of TPACK knowledge.

To address these identified gaps in the current literature, this study was guided by the following questions:

1. How do trainings based on TPACK or Quality Matters frameworks influence instructors' (a) technology adoption, (b) course design choices, and (c) self-beliefs about efficacy to teach with technology?
2. How does the training an instructor receives influence the students' learning experience?

Expectations

Research Question 1. Because QM is specifically focused on course design considerations I predicted greater amounts of course design changes by QM trained faculty compared to those who completed other forms of training. Similarly, the direct focus on course design and the corresponding lack of emphasis on the affordances of tools provided by the technology would also lead to more limited adoption of new tools in the QM group compared to TPACK or IT (control).

When assessing instructors' efficacy for design of and teaching with online LMS tools, I also predict greater increase via direct instruction of TPACK compared to indirect effects obtained by instruction solely on known design principles (i.e. QM).

When assessing instructors' TPACK levels, QM trained faculty were expected to demonstrate increases in scores in the pedagogical knowledge types (PK, TPK, and PCK) because the QM standards are closely aligned to these TPACK knowledge types. The focus of QM on the students' experience emphasizes how to present or organize content in ways that are pedagogically sound. I also expected to see increases in scores in all TPACK areas for the TPACK trained instructors because this training condition was designed to implicitly develop TPACK through fostering acceptance and affordances of the LMS tools.

Research Question 2. I anticipated that students of teachers trained with a focus on user experience (i.e., QM) should be more satisfied with courses because a training focused on design focuses instructors on course development features (i.e., better organization and presentation of course materials) known to improve the quality of the student experience. The QM standards also are closely aligned with two instructional design theories that help promote learning – Cognitive Load Theory (Paas, Renkl, & Sweller, 2004; Sweller, 1999) and Generative Learning

Theory (Wittrock, 1992; Wittrock, 1974). By reducing cognitive load and providing students with authentic and active learning opportunities, QM designed courses will help cultivate the learning process.

Because TPACK has been found to build technological and pedagogical confidence levels in faculty, retention rates may also be higher than a control group since students are less likely to drop a course if the instructor is perceived to be knowledgeable with the LMS. In addition, there should also be a stronger association between tool use and achievement compared to students of QM trainees since domain specific examples will be used in training the English faculty.

This mixed methods design will use various methods to collect data to answer these research questions. The following section will expand upon the design of this study, training scenarios, and data collection and analyses methods.

Chapter 3

Method

The main purpose of this mixed methods multiple case study is to compare two different training methods – one that is instructors centered (TPACK) and the other that is user (or student) experience focused (Quality Matters). Additionally, further investigation of what happens after training can uncover how attending training may be beneficial not only to the training participants, but their students as well. In addition to evaluating these two different types of training methods, other goals of this study are to address unanswered questions in the TPACK and QM literature mentioned in the previous chapter. This multiple case study initially sought to test the effects of training each from both an instructor and user/student experience perspective:

Several challenges arose during different phases of this study. While several attempts were made to mitigate these obstacles, an ultimate decision was made to shift the methodology and modify some of the planned data analyses. In this section I will discuss those challenges and changes to each portion of the study.

Participants

Participants in this study consisted of instructors and students from a four-year higher education institution located in the western United States. The purposeful instructor sample was comprised of graduate teaching assistants (n = 2), part-time instructors (n = 6), and full time professors (n = 1) from the English department who were scheduled to teach English composition courses (ENG 101, ENG 101E and ENG 102 sections). This sample was limited to a specific discipline to control for any variances that might impact the results of the study

(Creswell & Plano Clark, 2011). Student data were collected from the students enrolled in the participants' sections of the courses to be redesigned after training.

All instructor participants completed the TPACK survey (Appendix B) upon enrollment and again at the end of the semester. Based on their selection of workshop days/times, they were assigned to one of three training interventions: technical LMS training designed by the university's Office of Information Technology (baseline/control), technical training plus TPACK guidelines, or technical training plus QM guidelines. The 9 instructors who participated in the study were equally distributed amongst the three training types.

The first challenge encountered during this study is an all too common problem associated with any training program – low attendance and retention (Backer, 2001; Spector, 2013). In fall 2015, an attempt to recruit faculty to participate in training was made prior to the start of the semester. Several emails were sent out to any instructors who were teaching ENG 101 and 102 sections. A presentation was also conducted at the instructors' orientation session held prior to the semester to announce the study and to recruit participants. Despite these efforts, which included offering a gift card incentive for those who participated in the study, only 9 registered and completed training. During that same semester, I moved forward with all phases of data collection.

Additional attempts were made to recruit trainees during subsequent semesters. Prior to fall 2016 more emails were sent out to offer more training. Unfortunately, no instructors signed up for training during this semester. A final attempt to recruit participants occurred prior to Spring 2017. As a result, three instructors signed up for training, but only one showed up.

Compounding the typical reasons for not attending training (e.g. lack of time, other obligations, etc.) (Backer, 2001; Spector 2013) was a decision made by the university to switch

learning management systems during the timeframe of this study. In 2015, the university was considering the future of the current LMS – Blackboard Learn (Blackboard Learn, 2009). In 2016, the university's Office of Information Technology and the Provost's office solicited feedback from the campus community regarding the university's LMS. Two options were presented: to continue using the current system or to transition to an entirely different LMS. A number of faculty and students expressed their dissatisfaction with Blackboard Learn and most welcomed a change. As a result, in February of 2017, an official announcement was made informing the campus that the university would phase out the use of Blackboard Learn and begin the transition to Canvas. Because of this turn of events, it was unlikely that faculty would be interested in any future offerings of Blackboard Learn training. Instead, they would more likely invest their time to learning the new system, Canvas.

Design

The initial design of this study was a mixed methods approach combining both qualitative and quantitative methods to examine training's effect on instructors' tool adoption, course design, and the impact on the students. The sequential mixed methods design was to complement the quantitative data with the course analyses and open ended survey questions (Johnson & Christensen, 2008). Quantitative data were collected through the questionnaires and surveys. More details on the measures and method for the purposeful sampling are outlined in the next section.

Because there were not enough instructors or consenting students to yield a high enough statistical power to make between group comparisons, a more qualitative design was adopted– multiple case studies. This methodology would allow for in-depth insight (Yin, 2009) to what

happens after receiving training in one of three methods – standard IT Training, training based on Quality Matters standards, or training based on the TPACK model. Through this method, data collected from multiple cases and sources (addressed in the next section) were triangulated. With a multiple case study methodology I was also able to make both within case comparisons as well as cross case analyses (Yin, 2009). In this study, cases were bounded by the method of training they received (Smith, 1978).

Measures

Technological Pedagogical Content Knowledge survey. Instructors' TPACK levels were assessed using the TPACK survey adapted from Schmidt et al. (2009) (Appendix B). It was administered in two phases: before training and at the end of the semester. The pre-test survey set the foundation for comparing survey responses at the end of the study. The multiple responses helped gauge any changes to any of the constructs within Technological Pedagogical Content Knowledge that may have occurred.

The TPACK pre-survey (Appendix B) consisted of 7 demographic questions, 1 open ended question, and 30 Likert-scale items ranging from 1 = strongly disagree to 5 = strongly agree. The questions were tailored to measure knowledge levels of each TPACK constructs – technology knowledge (TK), content knowledge (CK), pedagogy knowledge (PK), pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPACK). The alpha reliability coefficients of each TPACK construct in previous research (Schmidt et al., 2009) have rated .75 or higher. Table 1 illustrates the reliability of scores from the survey for each TPACK domain.

Table 1. TPACK Survey Reliability of Scores (Schmidt et al., 2009)

TPACK Domain	Internal Consistency (alpha)
Technology Knowledge (TK)	.82
Content Knowledge (CK)	
Social Studies	.84
Mathematics	.85
Science	.82
Literacy	.75
Pedagogy Knowledge (PK)	.84
Pedagogical Content Knowledge (PCK)	.85
Technological Pedagogical Knowledge (TPK)	.86
Technological Content Knowledge (TCK)	.80
Technological Pedagogical Content Knowledge (TPACK)	.92

In addition to the 30 Likert questions, the post TPACK survey (Appendix C) contained 7 open ended questions. These open ended questions were used to explore rationales behind changes made to courses as well as the adoption of new tools. Due to the small sample size, instead of comparing changes across cases, changes that occurred for each individual before training and at the end of the semester was examined. Through this comparison, I can establish what happened as a result of attending training.

Post-workshop satisfaction survey. The post-workshop satisfaction survey (Appendix D) was administered immediately after the participants completed training to measure instructors' satisfaction levels with the training received. It was comprised of 9 Likert scale items ranging from 1- strongly disagree to 5 strongly agree. In addition to these Likert scale items, standard open-ended evaluation questions were included to gather additional information regarding training. Finally, additional survey questions were used to capture both the types of

changes each instructor made to their courses and the rationale behind these changes. For example: “In the space provided below, indicate a numbered list of the changes you made to your course.” And 2: “Looking at the changes above, provide an explanation for why you made each change.”

Content analysis of courses. The layout and content of each instructor’s course(s) was captured in 3 waves: a) prior to training (i.e., baseline when in template form and/or from a previous semester), b) post training (i.e., to capture immediate changes), and c) at the end of the semester (i.e., after finals week). Any changes to course design, content areas, and adoption of or repurposing of Blackboard Learn tools were noted per wave. Detailed notes were taking during each course comparison (see Appendix E). Evidence of changes were also documented using screen captures of each course (i.e., one per content area and each folder within each area).

End of semester student satisfaction survey. A five item student satisfaction survey (Appendix F) was administered electronically at the end of the semester to assess student satisfaction with the courses taught by faculty who completed training. Survey questions consisted of Likert scale questions with five responses, adapted from Ralston-Berg, 2014, that assessed the students’ perceptions of the organization of the course, instructions provided by their instructor on using the LMS tools, and response time of the instructor.

Despite instructors making announcements in their classes and the researcher emailing the students directly, the return rate was extremely low. Unfortunately, the response rate was not sufficient to make comparisons between the three different training groups. However, student survey responses from one of the Quality Matters trained instructors were evaluated since a majority of her students completed the survey.

Training Models

Two workshops were offered for each group throughout the training phase of this study. The workshops adhered to the recommended practices of training as outlined in chapter 2. For example, workshops lasted no more than 2 hours each, were topic specific to concentrate one task at a time, designed to have clear and obtainable goals, and allowed faculty the opportunity to do hands-on practice through "Your Turn" activities. While I intended to incorporate collaborative activities, due to the small number of participants, the workshops consisted of only 1 or 2 attendees. I still made attempts to engage the participants in discussions related to their discipline. In addition to these features, workshops were modified to incorporate design principles based on TPACK or Quality Matters guidelines. A sample of the agenda and guide for all three training methods can be found in Appendices G, H, and I.

IT standard training. The standard IT training followed a basic training design. See Appendix G for a sample of the agenda and guide. It included an introduction to the tool, demonstrations, and hands-on practice. Goals and objectives were clearly stated at the beginning of each training session. However, any examples provided to the trainees were generic in nature and not connected to their specific domain – English composition. While the features of each tool was illustrated, no attempt was made to foster the instructors' acceptance of the tool.

TPACK Blackboard Learn training. Blackboard Learn (LMS) training designed based on TPACK was primarily instructor centered. It did not explicitly teach the instructors the different TPACK constructs. Instead, training was designed based on Koh and Divaharan (2011) utilized Niess' (2007) five stages of TPACK development. These stages were found to help instructors develop their TPACK by focusing on three phases: 1) fostering the training participants' (instructors') acceptance of technology, 2) using techniques to improve instructors'

technical proficiency for an LMS tool and their ability to use these tools pedagogically through modeling uses of the tool, and 3) pedagogical application (Koh & Divaharan, 2011) or hands-on practice. These techniques are intended to build instructors' confidence in and provide strategies for utilizing the LMS tools effectively. Appendix H is an example of how TPACK training was conducted. Examples used in this training were aligned specifically with English composition topics/tasks.

Quality Matters Blackboard Learn training. Although the Quality Matters process is limited to reviewing courses that have already been taught, I used the QM rubric as a foundation for LMS training. The training model based on Quality Matters integrated the recommended QM standards during each training session (see Appendix I). The QM standards were used as recommendations for utilizing the various Blackboard Learn tools. Additionally, while covering topics such as communication tools, organizing content in the LMS, and tests, information about how to align these items with course objectives and organize activities/content were also addressed.

The original design of this study was intended to also incorporate a peer review process to allow participants to provide feedback to one another. However, since the workshops consisted of either 1 or 2 participants at a time, the peer review process was omitted. Instead, the QM rubric was reviewed, and we practiced using the rubric to evaluate examples of activities provided during the training sessions.

Procedure

Procedural tasks for the study were divided into four phases – recruitment, pre-training, training, and post training. This study originally planned to take place during mid-summer and

extend through the end of the fall 2015 semester (December). Another challenge that arose during this study was the timing of departmental events, which were out of my control. This pushed back the timing of all of the phases in this study. In the original design this phase of the training was expected to occur during mid-summer. Unfortunately, instructors and GAs for ENG 101 and 102 were not given their teaching assignments until August. With the department's instructor orientation scheduled approximately a week prior to the start of the semester, the early phases of the study that were expected to occur prior to the start of the semester did not occur until August and after the semester started.

Phase 1 – Recruitment. Recruitment for training participants took place in August. The English department's lead instructors for ENG 101 and 102 courses were approached in the spring semester and they agreed help recruit their ENG 101 and 102 instructors for the training/study. In addition to an email sent out to the lead instructors that were disseminated amongst the ENG 101 and 102 instructors, I was also invited to speak at the ENG 101/102 faculty and graduate teaching orientation session in August. During these sessions, a sign-up sheet and consent forms were distributed and collected. For a final attempt to recruit participants, a second email and an electronic version of the consent form were sent one final time. As mentioned previously, after a low turnout during this phase, additional attempts to recruit participants were made in following semesters.

Phase 2 –Pre-training. Once participants' consent forms were received, participants were asked to register for training sessions of their choosing. This determined which of the three different types of training they would receive – IT Blackboard Learn training, TPACK Blackboard Learn training, or QM Blackboard Learn training. Prior to registration, each session was predetermined to be IT, QM, or TPACK based. The pre-TPACK survey was also

administered to all participants prior to the start of the training sessions to serve as a baseline for measuring instructors' technology integration efficacy levels. Finally, each instructor's course was archived prior to the start of training. This captured the course design in its original state and was used to compare any changes made as a result of attending training.

Phase 3 – Training. Each group had the opportunity to participate in two training sessions – one focused on organizing the course and the other on the Blackboard Learn tools. While intended to occur prior to the start of the semester, because the instructors were not assigned to their courses until August, this pushed training back approximately two weeks. Instead of being scheduled prior to the start of the semester, training sessions were scheduled about a week into the fall semester. While not ideal, I was still able to capture courses in their original state and compare changes that were made after training.

Phase 4 – Post Training. Data collection and course observations took place after training between August and December. Immediately after training was complete, data was collected through an archive of courses and an end of training survey that measured satisfaction levels with training received as well as changes made and rationales behind those changes.

At the end of the semester, the following events took place: administration of another instructor TPACK survey, end of semester student survey along with consent to examine course data after grades are assigned, end of semester course capture/archive, and instructor follow up interviews, if necessary.

Data Analysis

To organize and analyze data from multiple sources for each case, the Complementary Analysis Research Matrix (CARMA) (Putney & Wink, 2014) was utilized. The purpose of

CARMA is to compare the expectation of program participants with the actual results or outcomes of participating in the program. The tool allows the researcher to organize the data, juxtaposing different perspectives on the use of a program, and illustrating the implications of program utilization. The sources of data included demographic data of each participant (including various levels of teaching and LMS experience), open ended and close ended survey questions, and notes taken from the comprehensive course analyses. Through CARMA, I was able to triangulate all these data to identify any patterns (Yin, 2009) as a result of training regarding instructors' tool adoption, course design choices, and the impact on students. Although typically used for program evaluation, CARMA was used in this study to identify expectations of the different training methods and compare them with what actually occurred with each instructor (see Appendix J).

Question 1. How do trainings based on TPACK or Quality Matters frameworks influence instructors' (a) technology adoption, (b) course design choices, and (c) self-beliefs about efficacy to teach with technology?

To explore the effects of training on faculty technology adoption and course design changes, the course content analysis results were compared among the three groups. This included the number (quantity) and types (quality) of new tools adopted and design changes made in each course among groups. This was also compared with the results of the last two questions in the post-workshop surveys and the open-ended questions of the post-TPACK survey. Instead of a quantitative analysis of number of changes made, a qualitative approach was used to analyze the course changes made by each instructor. CARMA was used to identify and compare what was expected to happen as a result of attending training with what actually occurred. In this way, CARMA became a critical evaluation tool for examining the choices made

in relation to the trainings received by the participants. Triangulating the quantitative and qualitative data collected addressed the question of how training impacted both technology adoption and instructional design choices.

To explore the changes in self-beliefs about efficacy to teach with technology, I initially planned on comparing effects of training between groups using pre- and post- TPACK surveys. However, due to the low power provided by the smaller than expected sample size, the differences in individuals' pre-and post-test scores were compared instead. The TPACK domain questions will help identify any changes in the instructors' efficacy levels for teaching with technology.

Question 2. How does the training an instructor receives influence the students' learning experience?

To compare the effects of the type of training that faculty received on student learning, I initially planned on analyzing student satisfaction levels, retention rates, and grades using quantitative methods. Means and standard deviations of all data collected were going to be used to identify any differences between the three groups utilizing an ANOVA. Unfortunately, despite attempts made by the instructor and myself to recruit students, the number of student consent forms and survey responses received was extremely low (IT: $n = 1$, QM: $n = 29$ (20 from one instructor), and TPACK: $n = 6$). Instead of making between group comparisons, I used the end of semester satisfaction survey to gauge the satisfaction rates for the one QM instructor with their design changes and tool use.

Chapter 4

Results

In this study faculty who attended one of three scenarios for training - QM, TPACK, or standard IT training were observed. Each training condition varied based on their respective frameworks, with the IT training group serving as a baseline or control group where training was generic in nature and not domain specific. The differences between these training sessions will be addressed in this section as well as the observations that were made in the instructors' courses after training was complete. Table 2 outlines the similarities and differences between the demographics of the participants in each group.

Table 2. Participant Demographics

Participant	Course	Teaching Role	Years of experience with LMS	Years of experience Teaching	Age
IT Instructor1	101	TA	0	0	Over 32
IT Instructor2	101E	FT	5+	5+	Over 32
IT Instructor 3	101	PTI	5+	5+	Over 32
QM Instructor1	102	PTI	2-5	5+	Over 32
QM Instructor2	102	PTI	5+	5+	Over 32
QM Instructor3	102	PTI	5+	5+	Over 32
TPACK Instructor1	101	TA	0	0	27-32
TPACK Instructor2	101E	PTI	2-5	2-5	27-32
TPACK Instructor3	101E	PTI	5+	5+	27-32

Notes. Teaching roles: TA = Teaching Assistant, FT = Full time instructor, PTI = Part-time instructor

Within Case Narratives

IT. The first group - the individuals who received standard training not based on any specific framework consisted of a graduate teaching assistant (TA) assigned to ENG 101(IT Instructor1), a full time instructor assigned to ENG 101E (IT Instructor 2), and a part-time instructor assigned to ENG 101 (IT Instructor3). While the TA was new to both teaching English and using the LMS, the other two individuals reported having over 5 years of experience with teaching and LMS use.

QM. For the Quality Matters group, training was focused on taking the student's experience into consideration. Instructors received instructions on how to use the QM rubric to help guide their decisions regarding tool adoption and course design. Aside from receiving training based on QM, three things in common for this group was that they all were assigned to teach ENG 102, had over 5 years of experience teaching English, were part-time instructors, and were over the age of 32. QM Instructor1 & QM Instructor3 also reported having over 5 years of experience using the LMS whereas QM Instructor2 only used the LMS for 2-5 years.

TPACK. The TPACK training was focused on three phases: 1) fostering participants' acceptance of technology, 2) using techniques to improve instructors' technical proficiency for an LMS tool, and 3) pedagogical application (Koh & Divaharan, 2011) or hands-on practice. This TPACK group consisted of two part-time instructors assigned to ENG 101E (TPACK Instructor2 & TPACK Instructor3) and one graduate teaching assistant assigned to ENG 101 (TPACK Instructor1); all between the ages of 27 and 32. This was the most diverse group regarding experience with both teaching and using the LMS. TPACK Instructor1 was the novice of the group – this being her first time teaching and using the LMS and TPACK Instructor2 had

2-5 years of experience. TPACK Instructor3 was the veteran of the group - having a culmination of 5+ years of teaching English and utilizing the LMS.

Cross Case Narratives

CARMA was used to evaluate tool adoption and course design changes made by participants after training (see Appendix J). The CARMA matrix contained data from multiple sources: a) the TPACK survey's demographic and open-ended questions (see Appendices B and C), the post workshop survey open-ended questions (see Appendix D), and notes taken from each of the course analyses (see Appendix E). The first column contained what I expected to happen as a result of training and the subsequent columns contained data from each of the participants. Although shown as three separate tables (one for each training condition) in Appendix J, during the analysis phase, the tables were arranged next to each other to conduct a side-by-side comparison. The subsequent columns provided insight to what actually happened after training and will be discussed in this section. Figure 3 is an illustration of tool adoption patterns across the three training groups that was derived from the CARMA matrix.

Tool Adoption

In order to determine whether or not training increased instructors' tendency to try out new LMS tools in their courses, course captures were taken before the instructors attended training and used as a baseline for comparison. How instructors used the LMS prior to attending training was identified through this initial course capture. Based on course comparisons made throughout the semester, the different types of tools adopted were categorized into 6 major categories based on their functionality: a) organizational tools (folders, and learning modules), b) content items (files, web links, and videos), c) assessment tools (assignments and tests), d)

writing or collaborative tools (discussions, journals, blogs, and wikis), e) communication tools (announcements & course email/messages) and f) evaluation tools (grades). In addition to noting how many new tools were adopted, I also looked at how they were implemented and whether or not the tool was used by the students in the course.

Given that the TPACK training was designed to increase instructors' acceptance and comfort levels with technology, the TPACK trained instructors were expected to adopt more tools than the QM and IT groups. Because QM focused more on the student experiences, we did not expect them to explore using new tools post training.

As illustrated in Figure 3, all three groups initially used the LMS to provide their students with course materials and as a means of communicating with their students via announcements and course messaging/email tools. Additionally, the QM and IT groups also used Blackboard's grade center to record students' grades. This is consistent with previous studies (Kozalka & Ganesan, 2004; Malikowski et al., 2007; Morgan, 2003; Ping et al, 2013) that identified the common uses of an LMS.

Two main occurrences were observed post training regarding tool adoption. First, some instructors decided to incorporate a tool that they had never used before. Secondly, a few of the instructors stopped using a tool that they used prior to training; which sometimes led to using an alternative tool in its place (See Figure 3).

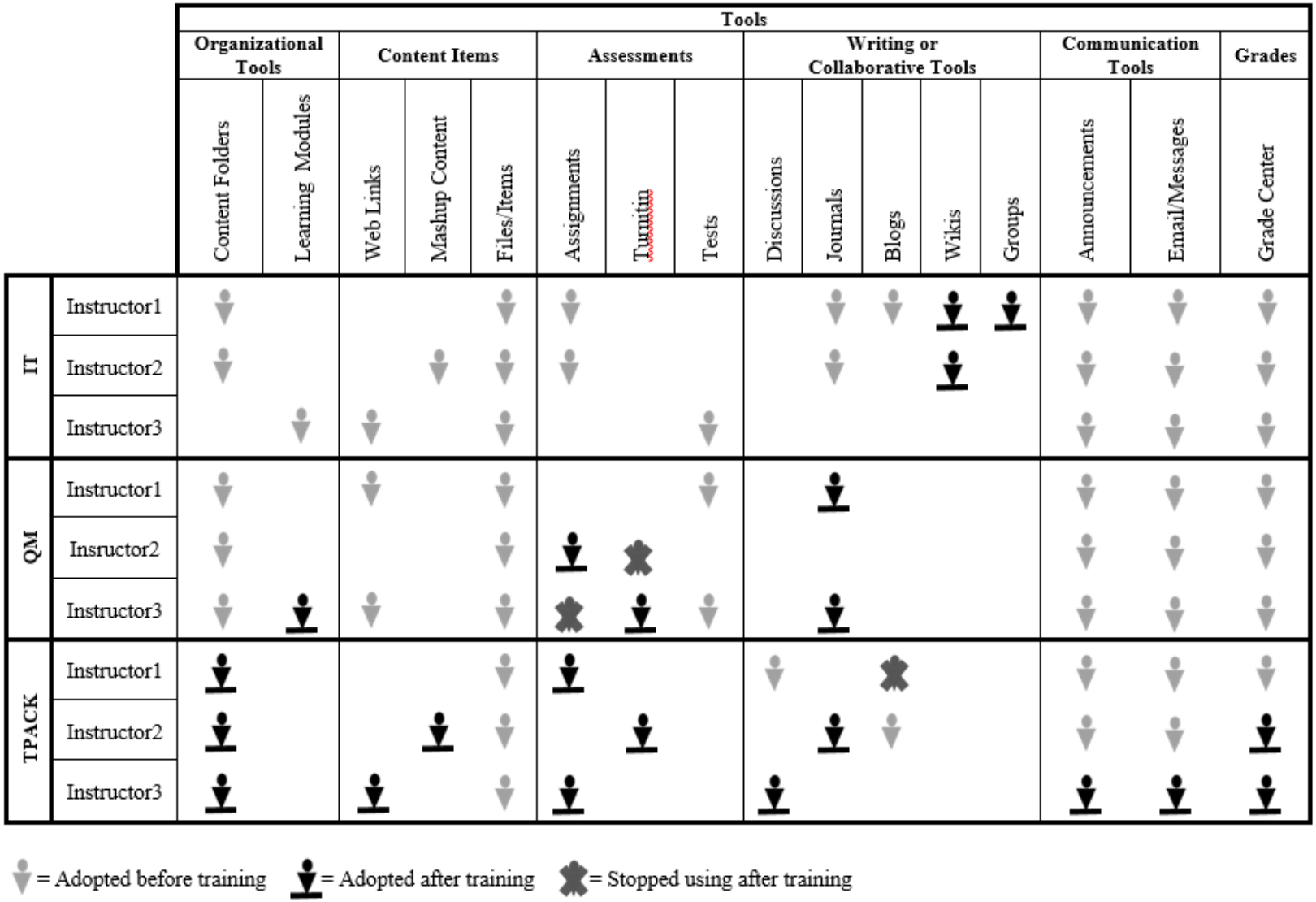


Figure 3. Tool adoption comparison

IT. IT Instructor1 started off using the least amount of tools in this group. However, the instructor had opted to use two of the tools (Blogs and Journals) in the same way. Students were given the option to post drafts and writing projects in either Blogs or Journals. This lacked consistency and a single means for turning in assignments these assignments. After training, both tools continued to be used in the same manner. Some students used the blogs while others used the journals to post the same assignment.

Post training, this same instructor decided to try out the wiki tool for both whole class and group work. The whole class wiki was not aligned with the tool's intended functionality of being a collaborative and/or writing tool. Instead, it was used as a sign-up sheet for student-instructor writing conferences; despite there being a group sign-up sheet tool available in the LMS. The instructor's group wikis paired up two students for a peer review activity (see Figure 4). While intended to be used for peer reviews, the wikis were not used by all students in the

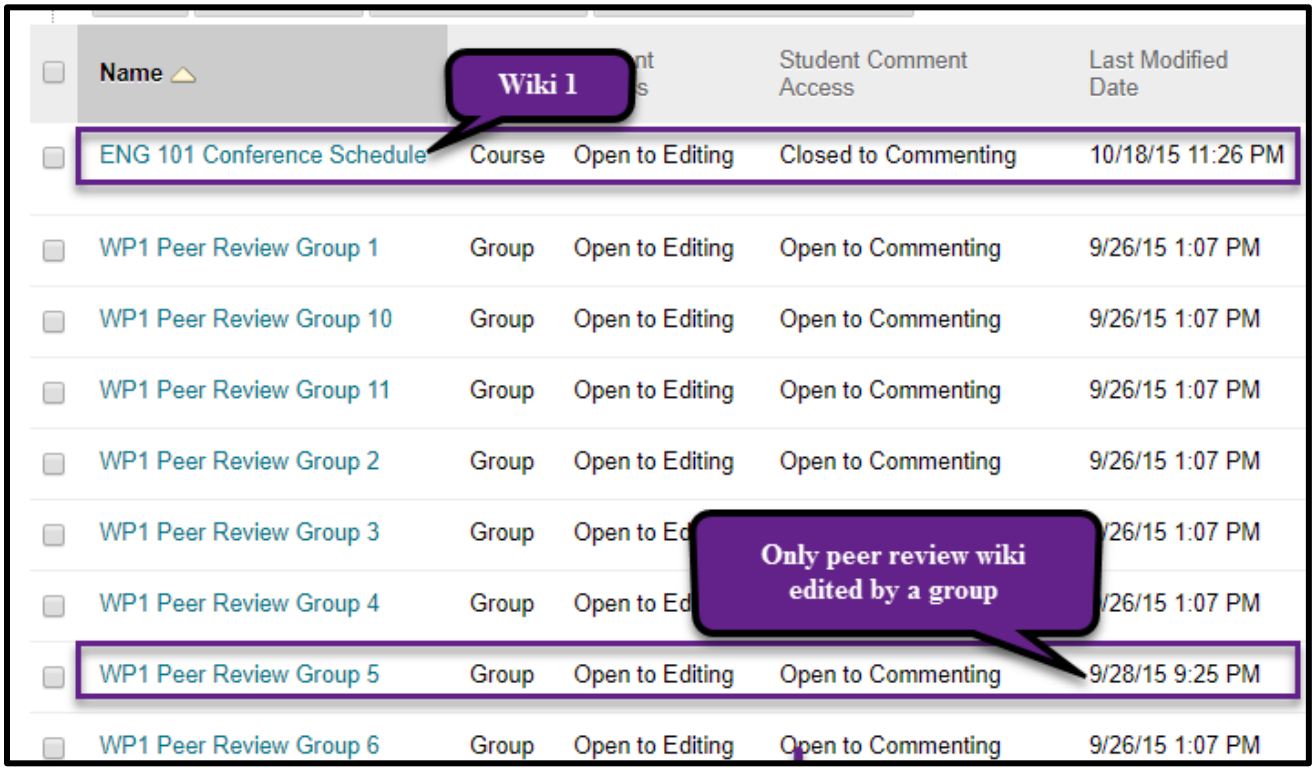


Figure 4. IT Instructor1's wiki

course. Furthermore, only one pair of students utilized the wiki space to upload their papers. This unsuccessful integration of technology into the curriculum has the potential to negatively impact the students' experiences (Katz, 2002; King, 2002).

IT Instructor2, the veteran of the group, also started off utilizing at least 1 tool in each of the categories. A majority of the tools were in content items, communication tools, and evaluation tools. After training, the instructor created a wiki space for the students to post papers to. The wiki contained clear instructions and an example of how to use the tool and what the students' wikis should contain. Despite the students using the tools, unlike the wikis in the previous instructor's course, IT Instructor2 reported that the activity did not go as planned. Furthermore, this instructor was "not sure how to get the students to use it better." (Appendix J)

IT Instructor3 - the part time instructor who had over 5 years of experience with both teaching and using the technology, used the LMS to deliver content, administer one test, and communicate with their students. He was the only individual in this group who decided not to try out new tools after he went through training.

QM. For the QM trained instructors, the focus of training was on the students' experiences. Contrary to what I expected to happen, three QM trained instructors attempted to use new tools after completing training. Two of these instructors also switched tools after training. As evident in their rationales for incorporating new tools, they took their students' experiences into consideration when deciding on how and which tools to use (see Appendix J):

- QM Instructor1: "Thought [journals] would be a good tool for revision/writing evaluation activities."
- QM Instructor2: "For student-student and student-teacher interactions in the process of writing papers."
- QM Instructor3: "Helped students with the writing process… allowed for both individual and group work."

QM Instructor1 only opted to adopt one new tool – journals. Like the novice instructor in the IT group, it was not heavily used throughout the entire semester. The journal was used for one activity in the course for the rest of the semester. But, the instructor was able interact with the students by commenting on the students' journal entries. This was expected as she did not use the LMS extensively - despite this instructor reported having 5+ years of teaching experience.

QM Instructor2 started off using Turnitin PeerMark™ prior to training. However, after recognizing that the students were having technical difficulties and started getting frustrated with

the tool, she switched to the Blackboard Learn assignment tool instead (see Figure 3). This was evidence of technological pedagogical knowledge development (Mishra & Koehler, 2006) – recognizing the limitations of the technology and being able to mitigate the technical problems by using a different tool.

QM Instructor3 opted to try out three new tools in her course. The first was utilizing Learning Modules to better organize the course content. More detail regarding this change will be presented in the course design changes section of this chapter. Similar to QM Instructor2, QM Instructor3 switched to using a different tool for assignment submissions after completing training. However, it was not due to technical problems. Instead, she wanted to utilize the plagiarism detection feature available in Turnitin. She started off using the built-in assignment tool provided by Blackboard, but after training was complete, she decided to try using Turnitin for assignment submissions (see Figure 3).

The most notable tool adoption was QM Instructor3's use of the Journal tool (see Figure 5) for various writing activities in her course. After training, the instructor added 9 new journal

Name	Visibility	Last Modified Date	Entries
Metaphors	Public	9/21/15 2:56 PM	0
Denotative and Connotative Word Choice	Public	9/21/15 3:30 PM	19(19 new)
Examining the Context	Public	9/21/15 3:43 PM	23(23 new)
Language style: Simple, compound, complex sentences	Public	9/21/15 3:43 PM	18(18 new)
Criteria WP#2	Public	9/28/15 2:27 PM	0
Evaluation Topic Sentences	Public	10/2/15 4:24 PM	20(20 new)
Annotated Bibliography Exercise	Public	10/21/15 3:22 PM	22(22 new)

Figure 5. QM Instructor3's Journal topics

topics by the middle of the semester; 7 of which were used extensively. She used her in-person class time to guide the students through utilizing the tool. For the second half of the semester, the students used the journals to develop different sections of a research paper. This helped break down the research paper into manageable chunks, making the task less overwhelming. Through the use of the journals, the instructor found that "students gained confidence in essay writing, the construction of arguments…" (See Appendix J).

TPACK. The TPACK instructors were a mix of veteran teachers and new graduate assistants. The goal of the TPACK training was to foster the acceptance of the technology – the data show evidence of this happening with two instructors' open ended responses to questions regarding their rationale behind adopting new tools (Appendix J):

- TPACK Instructor1: “Training provided me with tools to feel like I could understand and utilize [the LMS]. Empowered to use tools to more successfully incorporate technology….]
- TPACK Instructor2: “More familiar with grading and assessment tools. Grading is quicker, course content better organized – improving student experience, and [journals] allow students to warm up their own voice and writing styles.”

Prior to training, all three had been using Blackboard Learn as a way to communicate with their students and provide students with course files. After training, they began using more tools to help increase interaction with students, improve organization of their courses, and evaluate their students.

I hypothesized that this group would adopt more tools that the other two groups. Because this group of instructors were more conservative with their initial use of the LMS because of their levels of experience, the training they received allowed them to bridge the gap of tool adoption. It is plausible that they tried out more new tools than other participants due to a generational issue rather than a training one. Before training, they were not taking advantage of any organizational tools or assessment tools in the LMS. TPACK Instructor2 only used Blackboard Learn to provide students with course handouts or files.

It was observed that after attending training, two of the TPACK instructors (#2 & #3) started to explore new organizational, assessment, collaborative, and assessment tools within the LMS. The novice of the group (TPACK Instructor1) only elected to use two new tools (Folders and Assignments) (See Figure 3). In addition to utilizing these new tools, she also stopped using the Blogs after training – recognizing that the use of the discussion tool would help her accomplish her learning objectives.

Course Design Changes

Before presenting the results for changes made to the courses by each group, it is important to mention that prior to the semester in which this study took place, some changes were made to the LMS's starting course templates. These course templates gave instructors a starting point to work from when setting up their online courses shells. Both the university's IT and English departments developed their own templates to help improve the instructors' use of the LMS and students' experiences within the LMS by standardizing course navigation, some content, and tool availability.

Several professionals from various departments from the university formed a template committee and collaborated to redesign the LMS's starting course template that was pushed to all courses. At the same time, the lead ENG 101 instructor also developed a template for all 101 instructors to use. These templates were intended to provide instructors with a suggested layout for their courses. Since none of the template items were locked, instructors were free to make any changes once the template was applied. The university template developed by the template committee was copied to every course shell created in the LMS. Course menu items (see Figure 6-A) consisted of commonly used LMS items such as Announcements, Course Content tools, etc. Although content area placeholders such as Start Here and Course Content were provided, they did not contain any content (see Figure 6-B). Instead, instructors were provided with

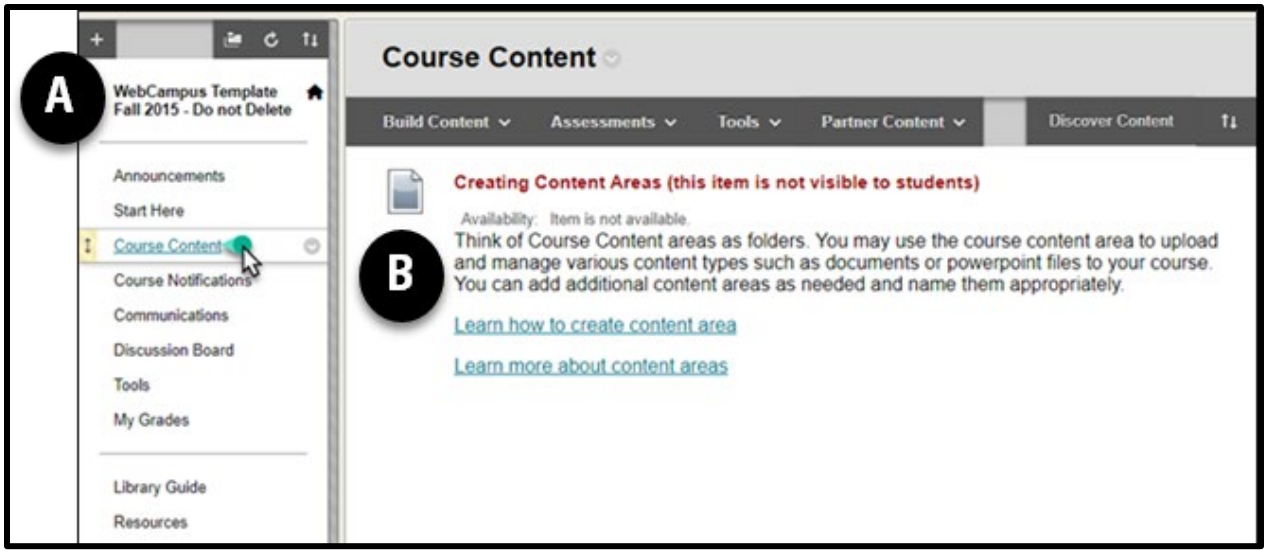


Figure 6. University template

information about how these content areas are typically used as well as links to instructions on how to update that section of the course.

In addition to this university template, the ENG 101 instructors were provided with an ENG 101 template. The ENG 101 template contained similar menu items (see Figure 7A) as the

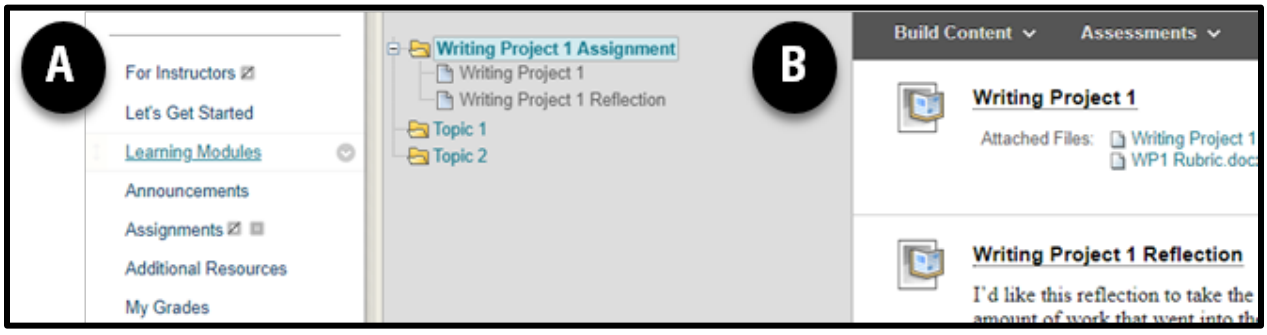


Figure 7. ENG 101 template

university template with a few exceptions. For example, an assignments content area provided students with a shortcut to suggested ENG 101 assignments for the course. There were also several content areas in the basic university template that were omitted from the ENG 101 template as well.

The content areas of the ENG 101 template were more detailed than the content areas of the university provided template (see Figure 7B). Although all of these items were hidden, the ENG 101 template provided instructors with tips on editing or using the template items, Learning Module spaces for each writing project, sample assignments, and an extensive gradebook configuration.

In this particular study, the instructors started either with the university template, a combination of the university template and the ENG 101 template, or copied content from a previously taught section/semester. When evaluating changes made to the course, this was taken into consideration. Changes were noted between the initial course archives captured prior to training, mid-semester, and at the end of the semester. Recorded changes consisted of any modifications made to the course navigation menu and structural changes to the course that included moving content and adding or hiding items. Each of these changes will be addressed in the following sections.

Course Menu Changes

Since the course menu was designed by a template committee comprised of IT professionals, instructional designers, and faculty guided by general best practices, I did not anticipate many changes to the course navigation for those who were provided with the university or ENG 101 template. Despite provision of a template, some changes did emerge. Most of the instructors made some minor modifications to their course menus. One consistent

finding amongst all three groups was that 72% of the course menu changes occurred between training and mid-semester. With the exception of one individual, most of the instructors committed to their course menu modifications early on and did not make any changes during the second half of the semester.

IT. The IT group of instructors made very minor changes to their course menu items. IT Instructor1 appeared to have started with both the university and ENG 101 template. Despite having duplicate menu items, this instructor only made one change – unhiding the Assignments course menu item. The duplicate menu items remained visible to students which either led to blank pages (Start Here) or repetitive content area links (Tools & Tool Area) (see Figure 8).

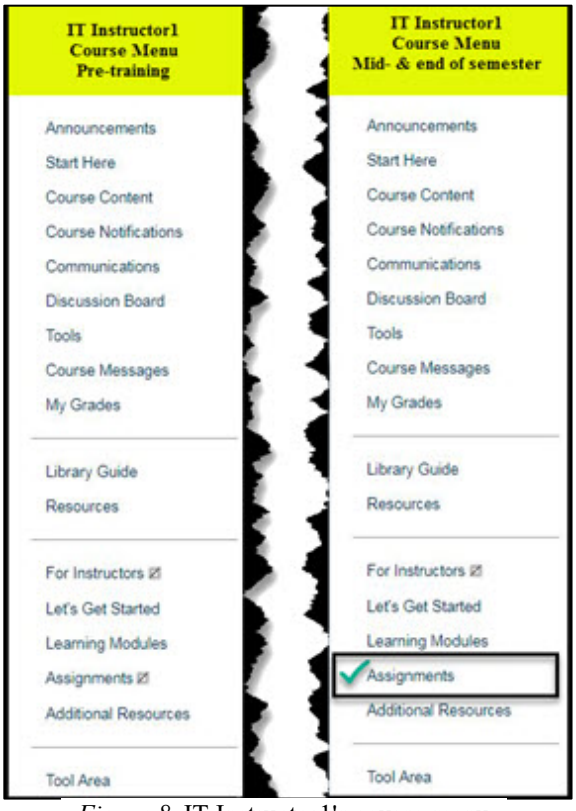


Figure 8. IT Instructor1's course menu

IT Instructor2 copied content from a previous semester on top of the university provided template. Prior to training, this instructor hid some of the content areas she was not using – keeping the course menu simple to navigate. The only changes made to the course menu in her course was unhiding the wiki link and repositioning that link below Journals (see Figure 9A).

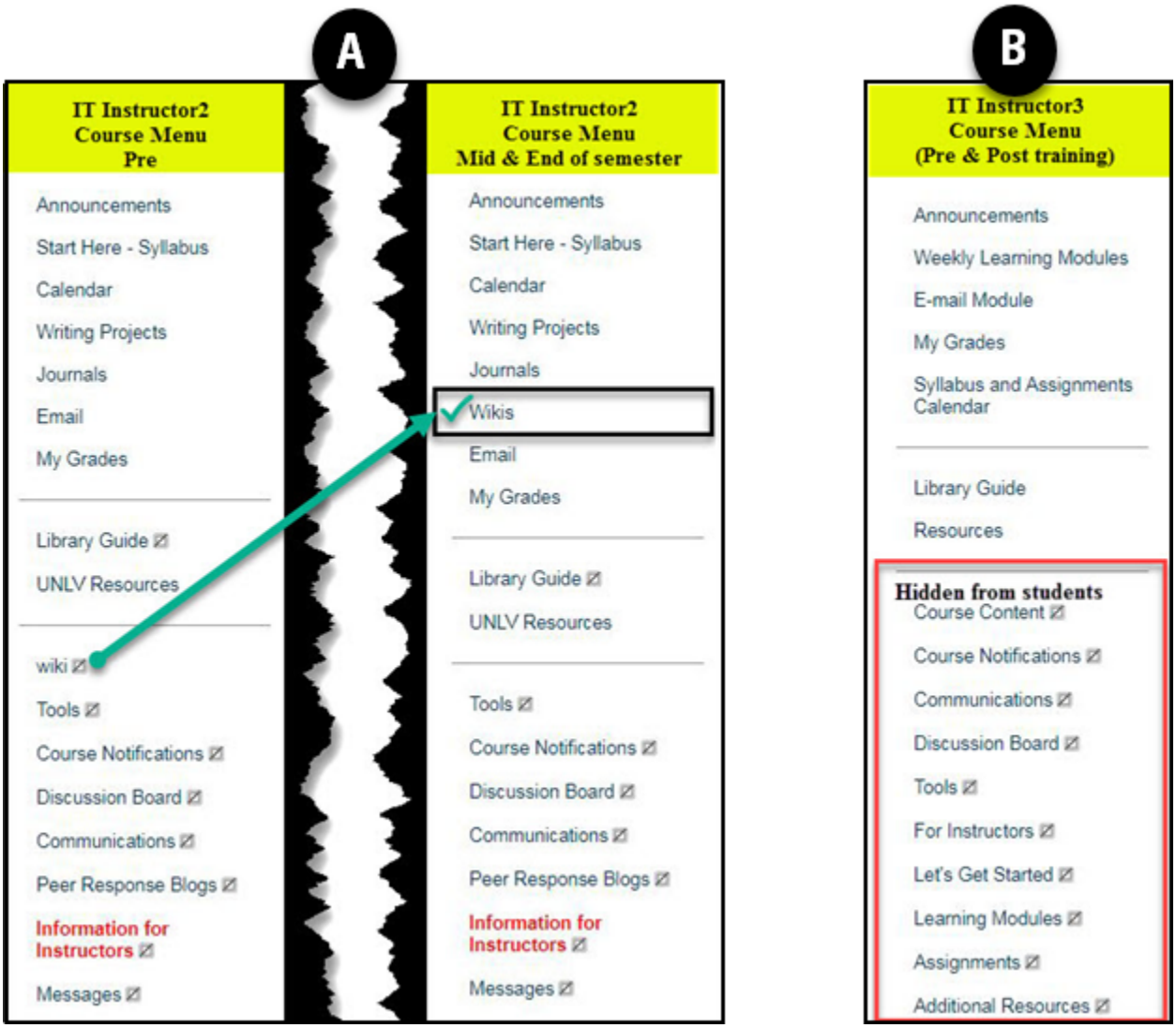


Figure 9. IT Instructor2 & IT Instructor3 course menus

Similar to IT Instructor2, IT Instructor3 copied content from a previous semester on top of the university provided template. This instructor also customized the menu to simplify navigation for the students by hiding duplicate or unused content areas or tools (see Figure 9B). These customizations were done prior to training and no changes were made after he attended training.

QM. The changes made to the course menus for the QM trained faculty involved hiding or removing unused items and adding shortcuts specific tools they decided to use in their courses following training (Figures 10 to 12). They also deviated a little from the university provided template by reordering the order of their menu items. QM Instructor1 (see Figure 10) made two

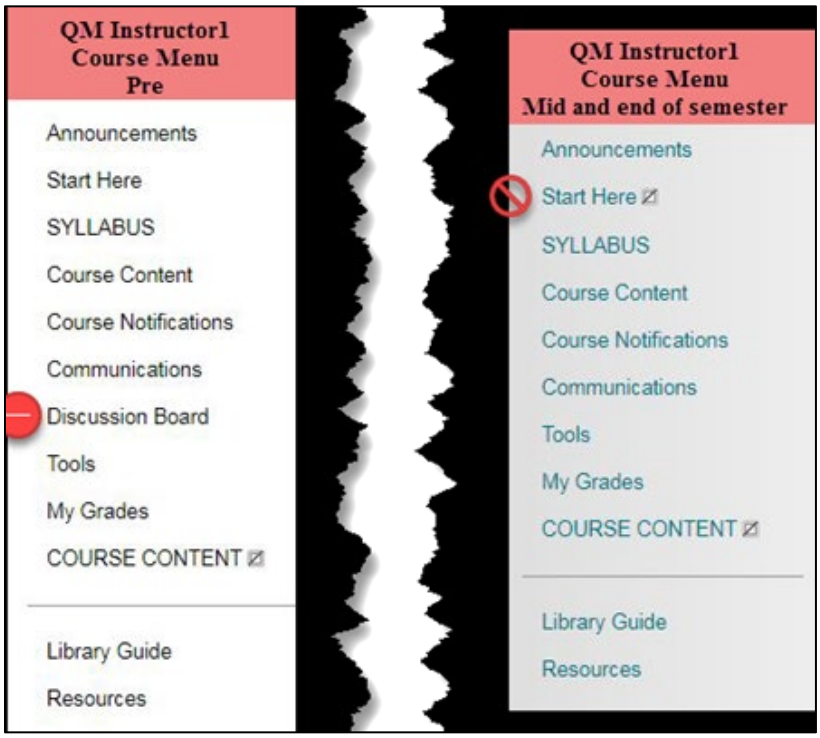


Figure 10. QM Instructor1's course menu

minor changes to her course menu. She hid one unused content area (Start Here) and removed the shortcut to the Discussion Board since she was not using that tool in this particular course.

Prior to attending training, QM Instructor2 did not modify the template's course menu items provided by the university template. After attending training, she made three changes (see Figure 11). First, she added a shortcut to the Calendar for the course. Second, she moved the

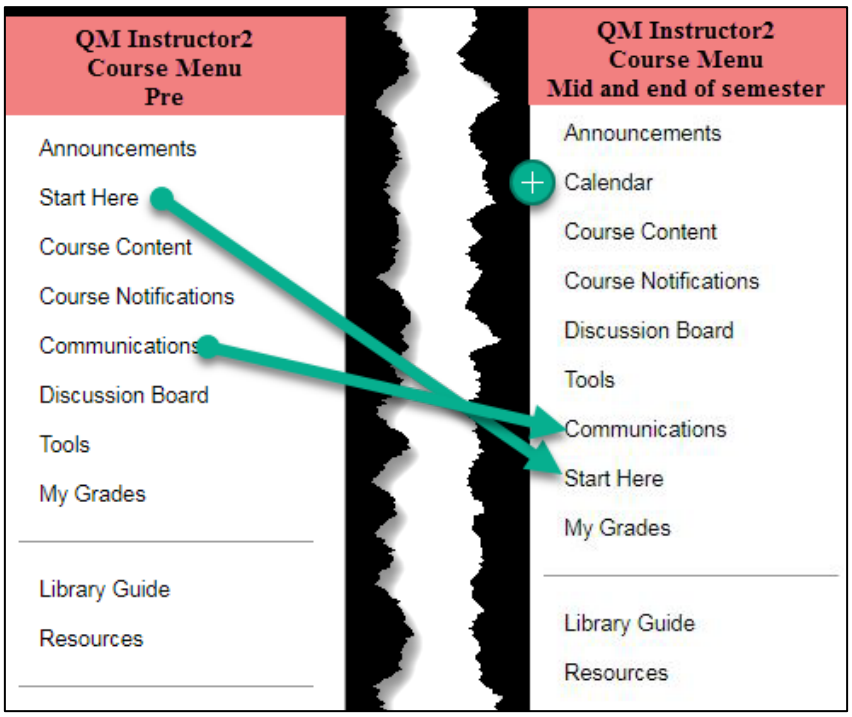


Figure 11. QM Instructor2's course menu

Start Here link towards the bottom of the list since she did not add any content to that area of the course. Third, she moved another link – Communications lower on the list as well.

QM Instructor3 started off with a copy of a course that she used in a previous semester. Before attending training she made modifications to the course menu by hiding content areas she was not using and adding her own shortcuts (see Figure 12). Upon completing training only a

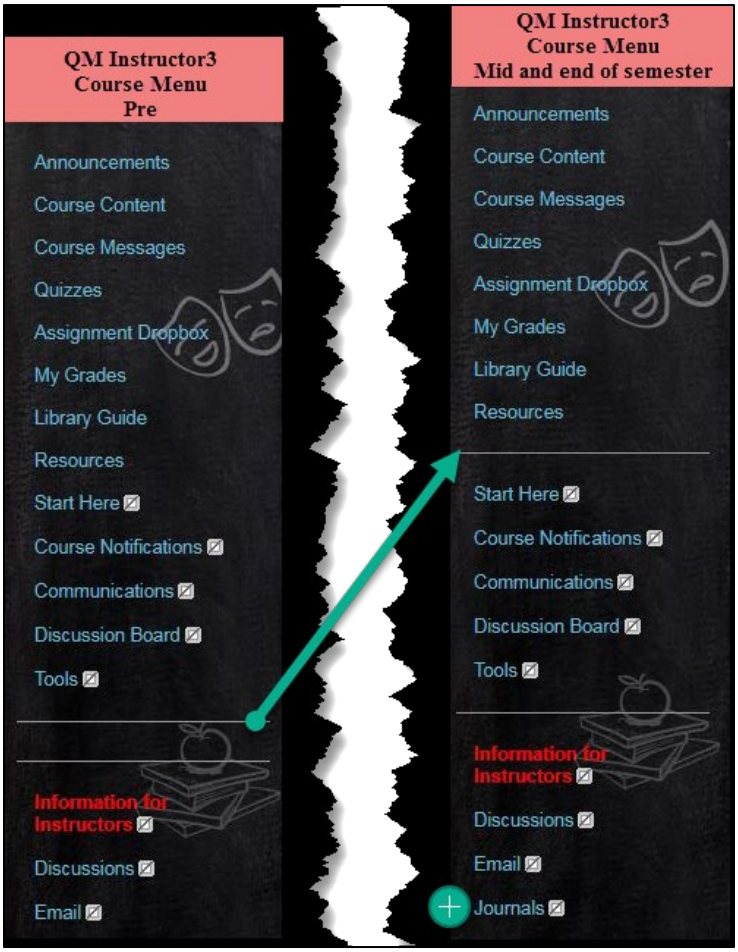


Figure 12. QM Instructor3's course menu

couple of aesthetic changes for the instructor view were made by adding line dividers between visible and hidden links. Another modification was adding a shortcut to a new tool that she chose

to adopt in the course – Journals. Since this was only visible to instructors, it was to give her quick access to the tool.

TPACK. For the TPACK group, a majority of the changes were done by a single instructor (TPACK Instructor3). TPACK Instructor2 was the only instructor, in all three groups, who did not make any changes to the course menu that was provided by the university issued template.

TPACK Instructor1 started off with both the university provided and the ENG 101 template. Like her counterpart in the IT group, she only unhid the Assignments links provided by the ENG 101 template. Unlike IT instructor 1, who was also a novice user/teacher, she rearranged her course menu items – moving Assignments higher on the course menu list and moving unused course menu links lower on the list. In addition to rearranging the course menu items, she also hid the 3 unused menu items from both templates – Course Notifications, Start Here, and Learning Modules (see Figure 13).

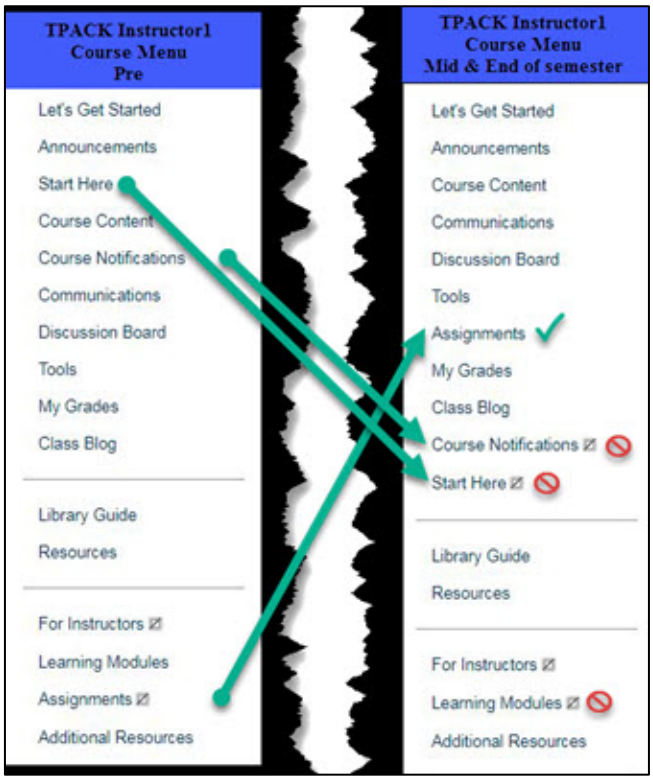


Figure 13. TPACK Instructor1's course menu

TPACK Instructor3 made the most changes to the course menu of all the groups (see Figure 14). However, instead of simplifying the menu like the other participants, this individual

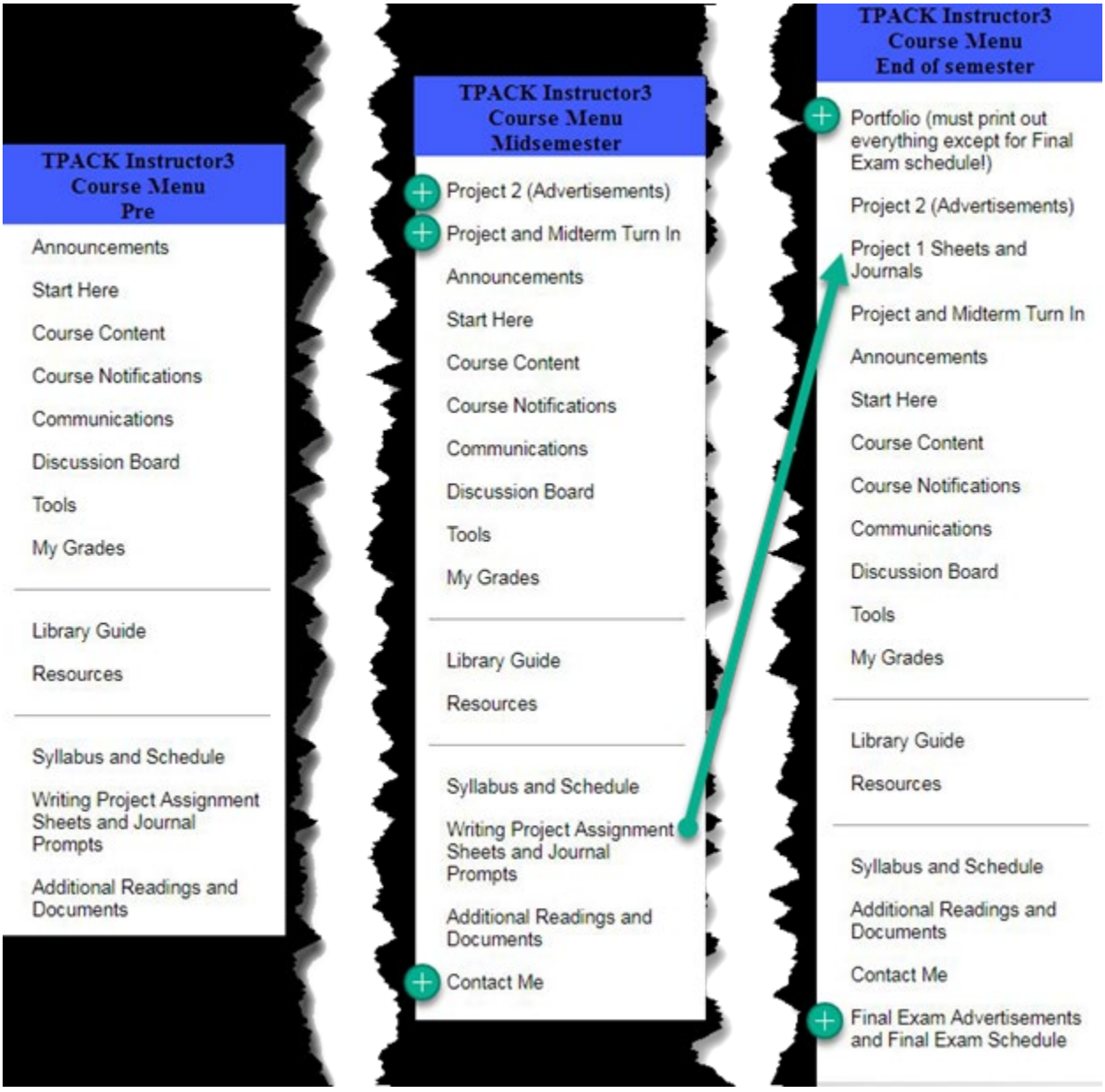


Figure 14. IT Instructor3's course menu

added a total of 5 new content areas to the course menu and only moved 1 menu item. The five content areas served as shortcuts to content grouped by type (i.e. Syllabus and Schedule, Project

1, and Project2). However, unused content areas such as Start Here or Course content from the university template remained visible to students – but led to blank pages.

Structural Course Design Changes

When examining structural changes to the course three main categories were identified – utilizing new organizational tools (course folders or learning modules), reorganizing the content within these folders/modules, removing items from the course itself, and adding new items or activities.

A majority of the structural changes to courses was the addition of new folders or learning modules. The TPACK group added more new folders than the rest of the groups. However, an individual instructor from the QM reorganized her existing content more than the other three groups. In addition to this, this same instructor also removed more items that was no longer relevant to her course.

IT. For the IT group, the individual who did not adopt new tools or make any course menu changes (IT Instructor3) added more folders than the others in that group as the semester progressed. However, after examining his course from a previous semester, this was the norm for him. Therefore, the training that he received had no bearing on these changes. IT Instructor2 also did not make significant changes to her course. The only change made was the addition of 6 new wikis.

The novice of the IT group (IT Instructor1) made the most changes in this group. Interestingly enough, she did not utilize any of the pre-made modules that were in the ENG 101 template. Instead, she created new folders, added new files, and added new wikis (see Figure 15).

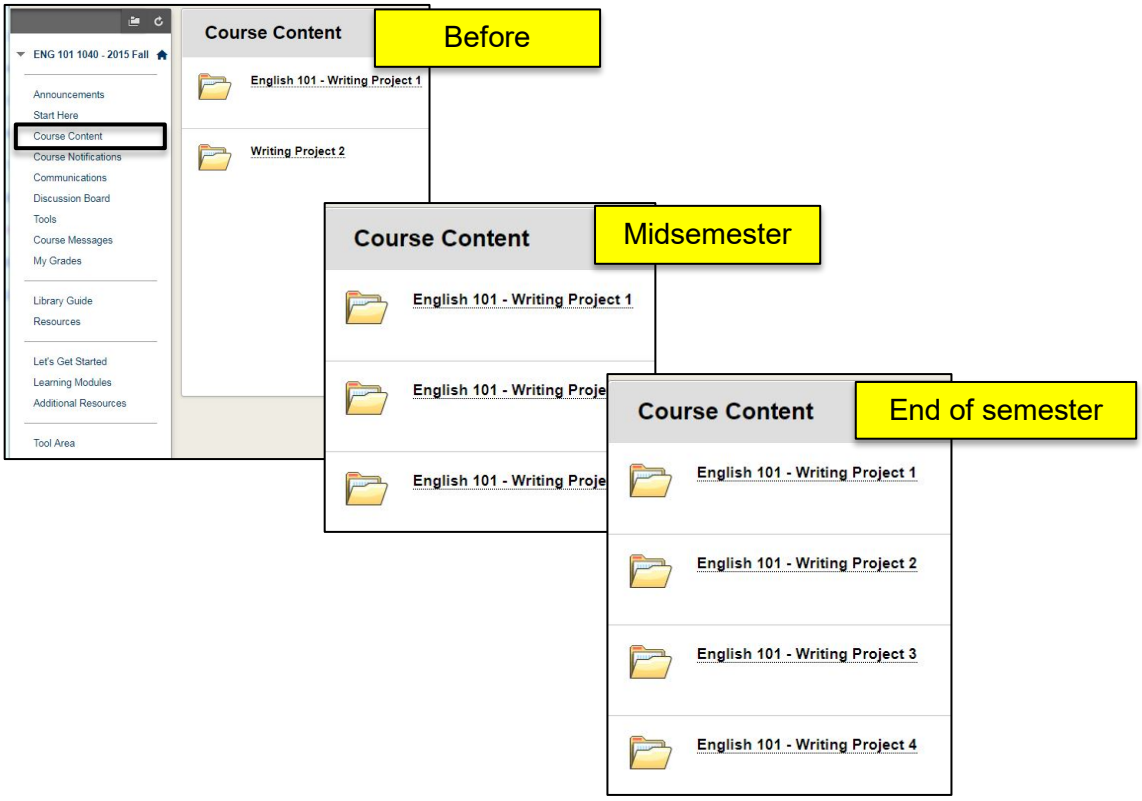


Figure 15. Screen captures of IT Instructor 1's Course Content Area

Although, as noted before, the students did not utilize most of the wikis that she created. The only content that she used from the ENG 101 template was the assignment templates – which she moved from the Modules area to the Assignments content area, as illustrated in Figure 6. In

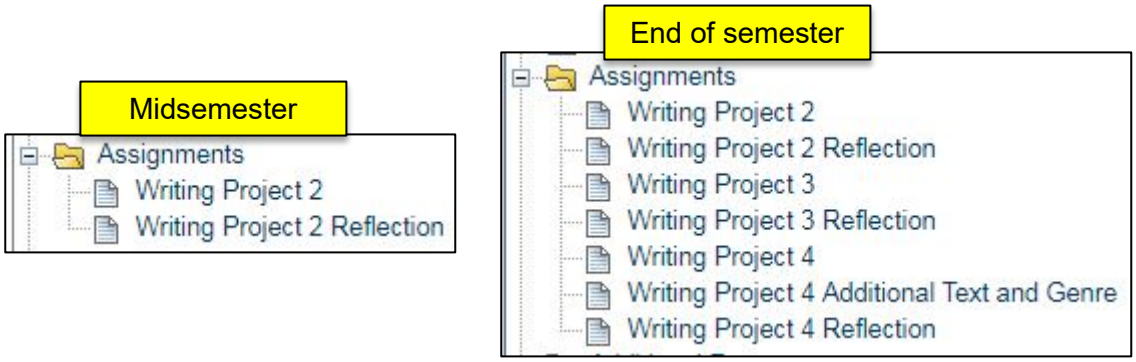


Figure 16. IT Instructor1's changes to the Assignments area
Note: Prior to training, the assignments folder was empty

addition to making the assignment links visible to students, she changed the instructions for the assignments to personalize those items.

QM. The QM group collectively made more structural changes to their course and reorganized their existing content. QM Instructor1 added new folders by project type as she had done prior to training (see Figure 17A). QM Instructor2 also added three new folders and organized their content by task (Figure 17B).

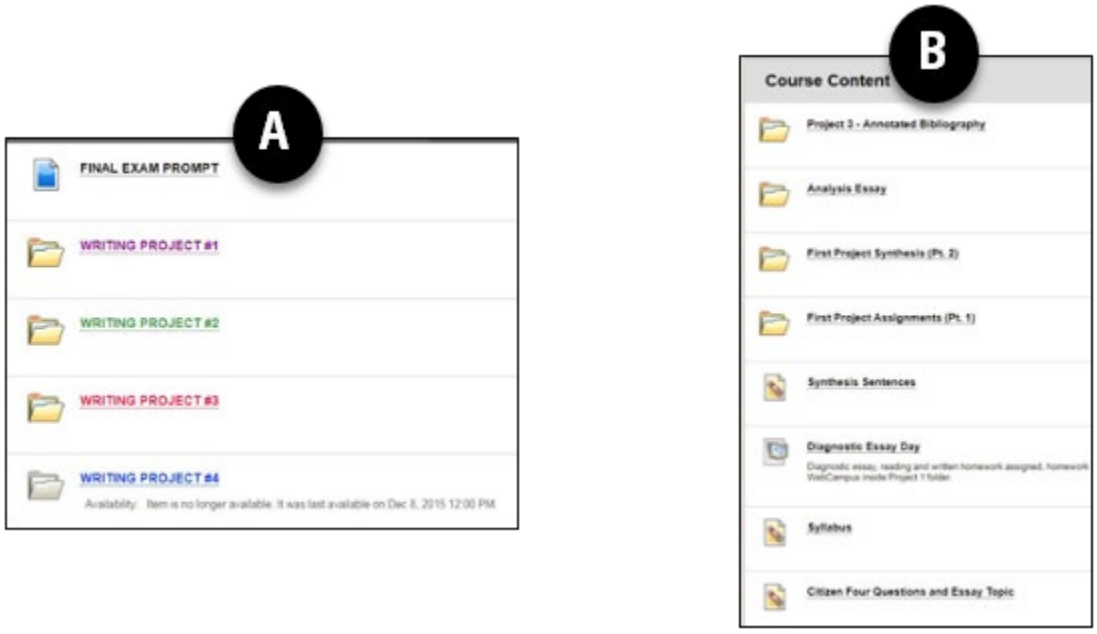


Figure 17. QM Instructor & QM Instructor2's course content

QM Instructor3 made the most changes to her course structure. Prior to training, all course files were added directly to the Course Content area. As illustrated in Figure 18, there

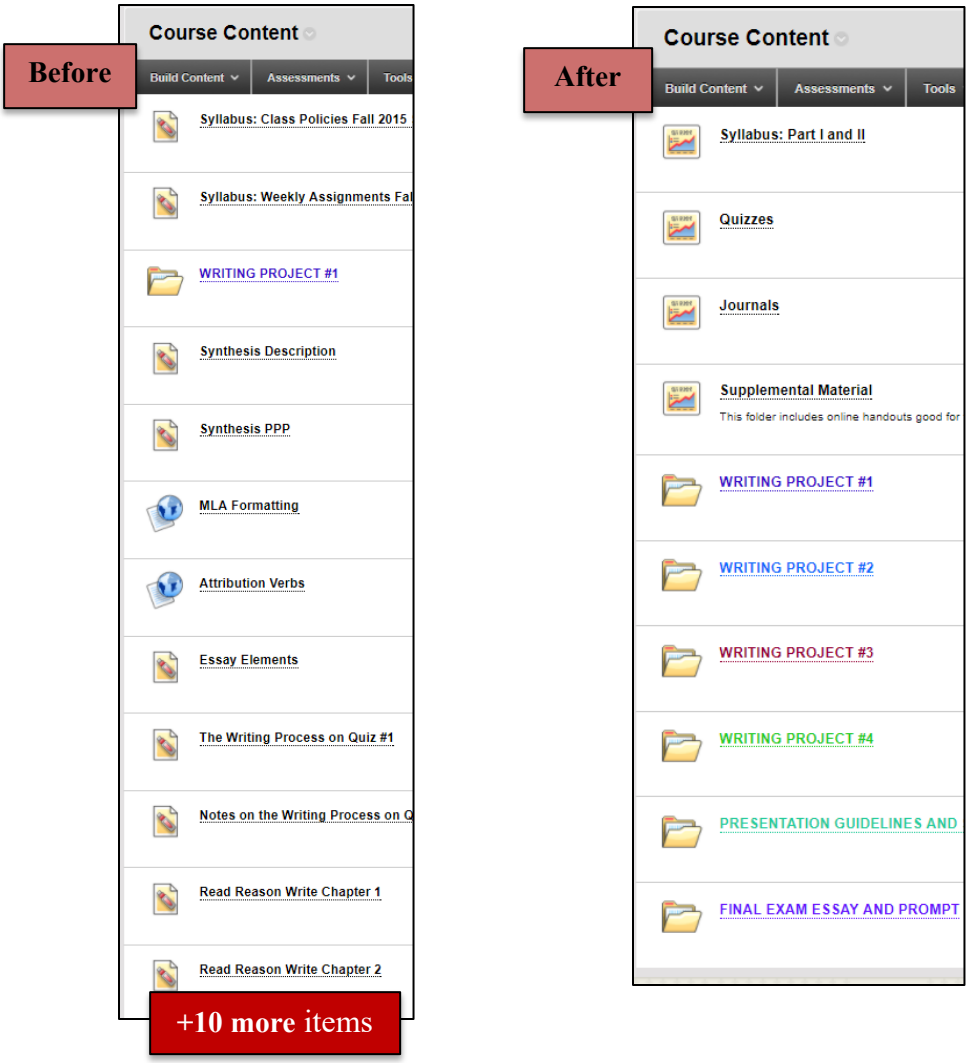


Figure 18. Before and after screenshots of QM Instructor3's course content area

were a total of 21 items in Course Content. After training she reduced the number of items by consolidating her materials into new learning modules. Four Learning Modules were added to the Course Content area based on content type (Syllabus, Quizzes, Journals, and Supplemental Material). By the end of the semester, her course content area was reduced to 10 items after removing files that she no longer needed in the course.

TPACK. The TPACK trained faculty also made changes to their courses throughout the semester. TPACK Instructor1 was not using the Course Content area to provide students with course materials prior to training. The initial course capture (Figure 19) shows that she had two

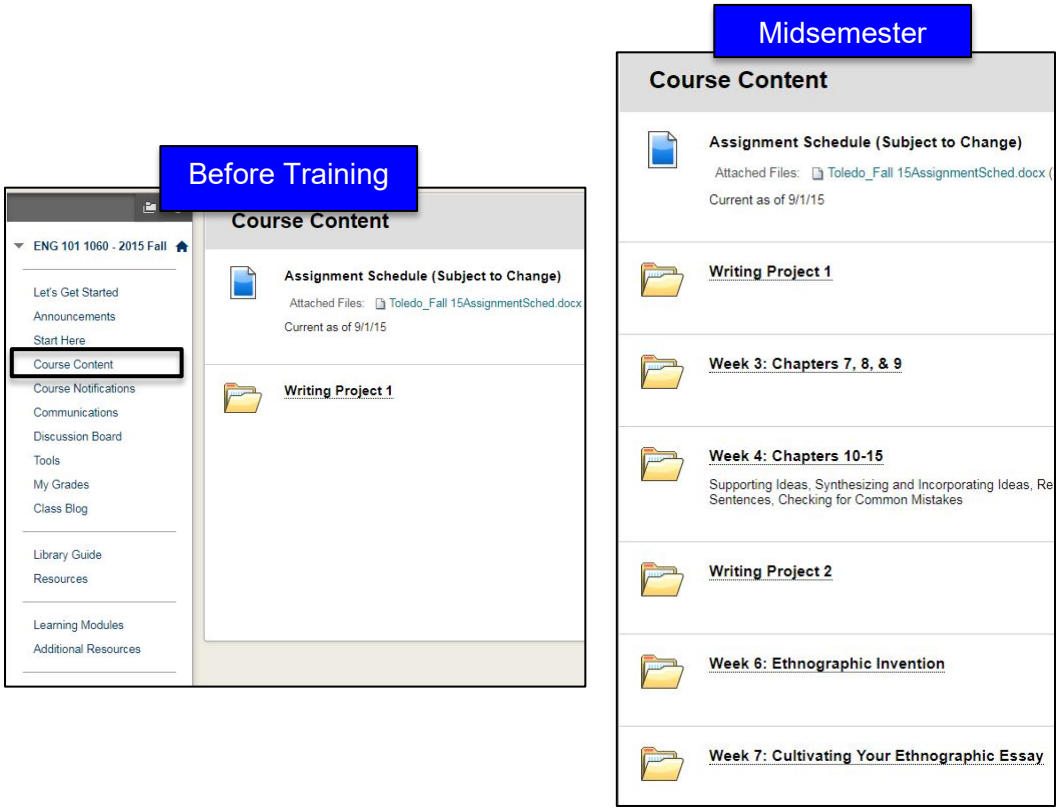


Figure 19. TPACK Instructor1's course content area before training and midsemester

items in course content - Schedule and Writing Project 1. Instead of adding files to a content folder, she was using the Announcements tool to provide students with files and instructions each week. After training, she created new folders in the course content area by week (see Figure 19). However, this practice stopped at around week 7. She then reverted back to using the

announcements tool again. At this time of the semester she went back to a tool that she was familiar with. By the following semester, she went back to using the weekly folder structure and used the announcements for news items for the course.

TPACK Instructor2 was also using the Course Content area as a file repository. Her normal practice prior to training was to add files to the content area without utilizing organizational tools such as Learning Modules or Folders. After training, she started using folders by content type. She added 5 new folders under course content and had moved her existing content (schedule & syllabus) to Start Here (see Figure 20).

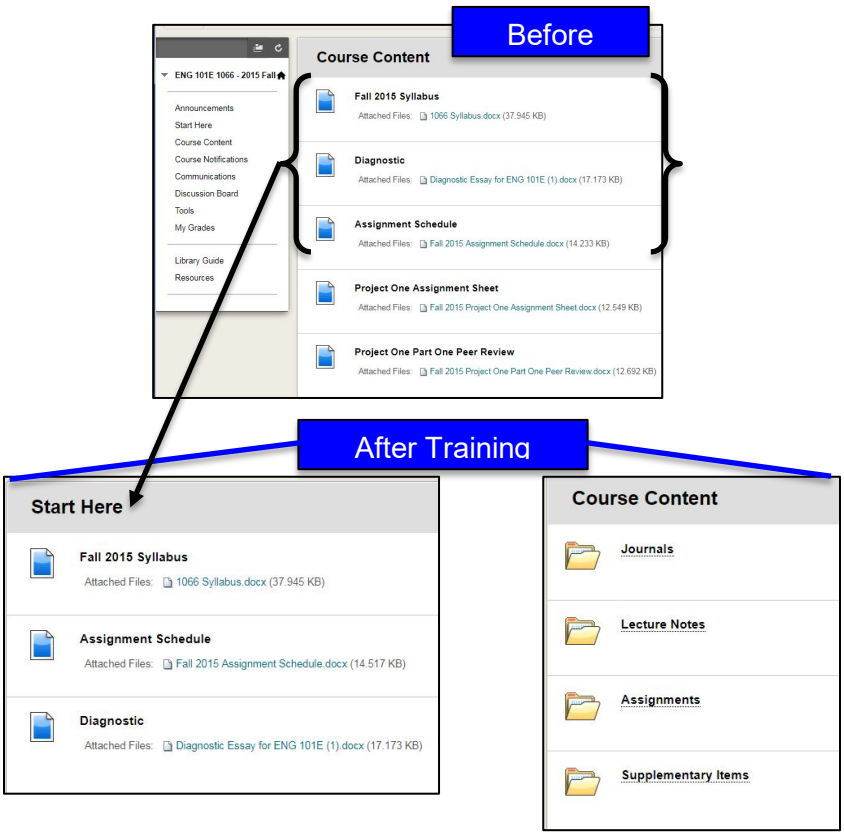


Figure 20. TPACK Instructor2's course content changes

TPACK Instructor3 also organized her content based on project type. However, instead of adding new folders or modules to the existing Course Content area, she added them directly to the course menu, as previously illustrated in Figure 14. After examining one of her sections from a previous semester, it is noted that she always added new content areas to her course menu. Like IT Instructor3, this was the norm for her, not the result of attending training.

Self-Beliefs – Efficacy to Teach with Technology

Before the instructors attended training, they were asked to complete a TPACK survey which helped establish a baseline of their TPACK levels in all categories - technology knowledge (TK), content knowledge (CK), pedagogy knowledge (PK), pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPACK). Because of direct instruction in the TPACK training, the TPACK group were expected to have the most gains in their self-beliefs related to teaching with technology in all TPACK Knowledge types. With the QM group, increases in the PK, TPK, and PCK constructs were expected because, as shown in Appendix A, the QM standards closely aligned with these three constructs (Ward, 2012). Changes between the TPACK scores from the pre and post survey can be found in Table 3. Overall, prior to training, all participants highly rated their content knowledge so no changes were seen at the end of the semester.

Table 3. Componential Analysis of Changes in TPACK pre and post survey results

	Pedagogical Knowledge	Technological Knowledge	Content Knowledge	Technological Content Knowledge	Technological Pedagogical Knowledge	Pedagogical Content Knowledge	TPACK
IT Instructor1*		+		+			
IT Instructor2***	+	+		+	-		
IT Instructor3***	-	+		+	+	-	
QM Instructor1***	+	+		+	+	+	+
QM Instructor2***		+		+	+		
QM Instructor3***	+	-		+	+	+	+
TPACK Instructor1*	+	-		+	+		+
TPACK Instructor2**	+	-	+	+	+		
TPACK Instructor3**	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: * = novice instructors, ** = 2-5 years of experience, *** = veteran instructors; TPACK Instructor3 did not complete the post-TPACK survey.

However, the data show a drop in three individuals' perceived technical knowledge (TK) after training (QM Instructor3, TPACK Instructor1, and TPACK Instructor2). This is contrary to what I expected, especially for the TPACK group. Because the TPACK training was focused on improving teacher skills/knowledge, I expected increases in all TPACK areas, especially in their self-beliefs about their technical skills. But as Table 3 shows, this was not the case for two of the instructors. QM Instructor3 also showed a drop in the TK area despite successfully using the journals to aid the students in their writing process and making the most course design changes.

Based on an in-depth look at the individual TPACK survey questions that were related to the technological knowledge construct, it was determined that this drop may have been due to an increase in self-awareness of their technical deficiencies following training since it exposed these

instructors to different tools in the LMS that they were unfamiliar with (see Figure 21). The QM3 and TPACK1 instructors rated themselves lower in the following areas a) knowing how to

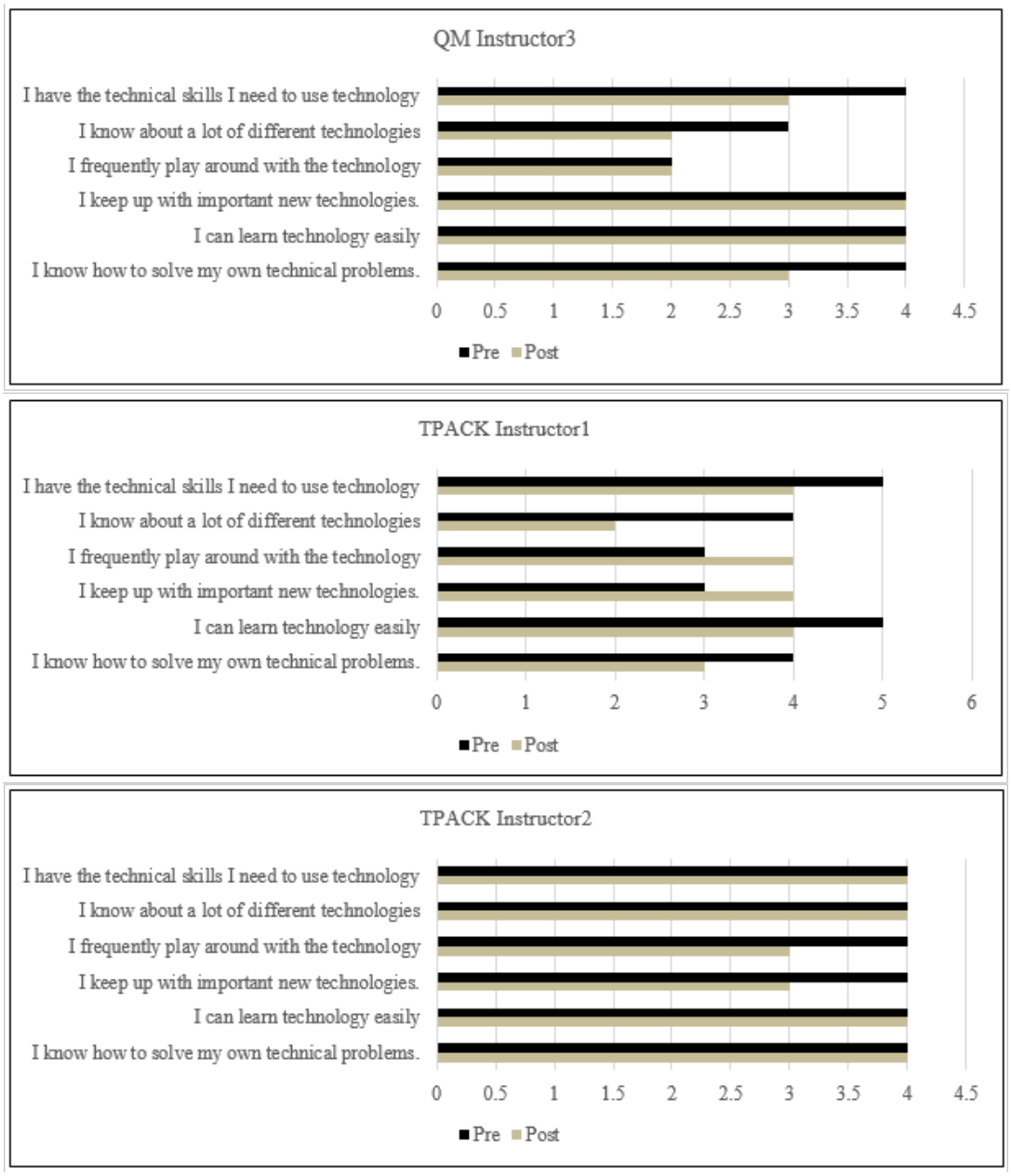


Figure 21. TK question pre & post survey results for three instructors

solve their own technical problems, b) their knowledge about a lot of different technologies, and c) their technical skills needed to use technology. The TPACK2 instructor gave a slightly lower rating after training for her a) ability to keep up with important new technologies and b) time spent playing around with the technology. Despite this drop in perceived technological knowledge, these three instructors reported that training made them more comfortable with the LMS and also made them aware of what the LMS had to offer (See Appendix J). This in turn empowered them to successfully integrate the LMS tools in their courses.

Another interesting finding was that the IT trained instructors reported greater self-beliefs in their technical knowledge after attending training (see Table 3). The instructor who did not make any changes to their course or adopt new tools had the greatest increase (0.67) within this group. Despite this increase, the other two instructors who opted to use new tools did not integrate the tools into their courses successfully. IT Instructor3, who felt overwhelmed during our training session reported "[The wikis] did not work as well as [she] hoped." and that she was "not sure how to get the students to use it better." IT Instructor1 thought she used the group wikis successfully, despite only 1 group using the tools.

As expected, for two of the QM trained faculty the data shows greater increases in the PK, PCK, and TPK arenas. QM Instructor1 who had the least amount of experience with the LMS had the greater increase in the PK (0.57) and TPK (0.89) areas than the other two in this group. QM Instructor3's largest increase was for her technological pedagogical knowledge (0.67). This was the instructor who used Journals after training to help her students with their writing process. Through the use of the journals, she reported that she was able to "identify student performance problems and provide individual feedback. Students gained confidence in

essay writing, the construction of arguments and expressing their ideas logically…" (Appendix J).

The QM Instructor2 showed a slight increase in the TPK area (0.11). The data also showed evidence of improved TPK in the instructors' responses to the open ended questions. For example, QM Instructor2 reported "Turnitin has some issues of accessibility in terms of dates… After the [training] I was able to jockey those so that students could review and revise online" (Appendix J). Also, despite reporting having "difficulties with Turnitin [to achieve her learning goals," QM Instructor2 reportedly would "attempt to use Turnitin again [after seeking help from] the IT office" (Appendix J). For PK and PCK, this instructor already had the highest confidence in these constructs and there was no change after completing training.

Only two of the TPACK instructors completed the post TPACK survey (TPACK Instructors1 & Instructor2). TPACK Instructor2's greatest improvement was her Pedagogical Knowledge (1.71). This was also her lowest rated knowledge type prior to training. Since this was her first time teaching, this was expected. She reported that "learning hands on what WebCampus… had to offer… empowered [her]… to more successfully incorporate technology in the structure of [her] course." She also reported that she "will probably continue to modify [the] use of the technology to meet the needs of each individual class" (Appendix J).

TPACK Instructor2 rated all 5s in all but one knowledge type (technological knowledge) at the end of the semester. The greatest increase for this instructor was her Technological Content Knowledge (1.5). She improved the organization of the course and also used the journals which encouraged students "to get warmed up and become familiar with their own voice and writing style" (see Appendix J).

Summary of Results

The results from juxtaposing the data collected through the course comparisons and surveys uncovered different patterns of tool adoption and course design choices between the different training groups (IT, QM, and TPACK respectively). The techniques used in the QM training to aid in course design via the student perspective and ones used in TPACK to raise their technical skills and comfort levels gave these instructors an advantage over the IT trained group of faculty. This is quite evident as we also see increases in self-reports of technological pedagogical knowledge in the QM and TPACK groups and do not see the same increases in all three of the IT trained instructors.

Tool adoption patterns varied across the three groups both in quantity (number of tools adopted) and quality (how they were used). After training, I observed the following: a) the IT training increased participants' technical confidence, but tool adoption was very minimal and they were used ineffectively, b) QM trained instructors made well thought out decisions regarding tool adoption and use of a few targeted tools, and b) TPACK training increased technical confidence in the instructors and resulted in a broad adoption of tools.

Regarding course design changes, all instructors made modifications to their course structure and course menus, with the exception of one instructor (IT Instructor3). But, the following patterns emerged: a) experience played a role in the IT trained faculty, b) the QM group made significant changes to their course menu and layout that reflected taking the students' perspective in mind, and c) TPACK course design changes varied – two of the instructors made better organizational changes over the other. Similar to the patterns we saw with tool adoption, the quality of changes varied among individuals, not groups. For example, two of the IT instructors, two of the QM instructors, and two of the TPACK instructors used the

opportunity to consolidate content into folders and/or learning modules. This made it easier for the students to find the resources they needed.

The course menu changes also varied across the board. It appeared that most of the instructors were afraid to delete items from the course menu. Instead, they reordered the items or hid them from the student view. Not all changes were of the same caliber within the groups and appeared to have been due to their experience or personal preference rather than the training they received.

The instructors' self-beliefs regarding their efficacy to teach with technology produced some unanticipated results. The TPACK group was expected to improve their beliefs in their technological abilities, but two of the instructors' self-beliefs dropped after training. Similar results were found for the QM instructor who successfully implemented the use of journals. An in depth look at the survey results for the technology related questions uncovered the phenomenon that attending training may have exposed these instructors to technology they were not aware existed. As a result, they rated their self-beliefs about their knowledge of different technologies and their technical skills needed to use technology lower than they did prior to training.

Reasons explaining the different ways training impacted each of the participants in this study will be addressed in the next section. A few of the significant findings that were extrapolated from the results are: a) the importance of drawing upon real or authentic examples in training, b) how instructors' level of experience played a role in the application of skills obtained from training, and c) how focusing on design from the students' experience (QM) vs. focusing on technical skills (TPACK) impacted instructors' TPACK development, course design, and tool adoption choices.

Chapter 5

Discussion

The purpose of this study was to identify the best ways to train instructors on how to use an LMS such as Blackboard Learn (Blackboard, 2009). The goal was to evaluate how training impacted instructors' tool adoption, course design changes, and the student experiences. This study revealed several practical implications for LMS training by identifying which factors lead to better design choices and effective tool adoption and use. Findings not only confirmed what can be found in the previous and current literature, but also explored uncharted territory in the LMS training realm – using course analyses to get a true picture of what happens after training as well as comparing different training methods.

As previously mentioned in Chapter 1, the review of the literature showed that when evaluating the effectiveness of professional development programs, practitioners often primarily rely on self-report questionnaires and self-efficacy scales (Kirkwood & Price, 2013; Kong, 2014). In this study, in addition to using these measures, I was able to identify whether or not participants applied what they learned through a series of course analyses following training. Through this technique, I was able to confirm what Rienties et al. (2013) and Tomte et al. (2015)'s found - that satisfaction levels with training and changes in self-efficacy scales are not an accurate reflection or predictor of successful use of an LMS. The disparities between the results from the self-reported measures and course changes surfaced for a few of the participants in my study. Three major findings that were drawn upon from the results are a) the importance of drawing upon real or authentic examples in training, b) how instructors' level of experience played a role in the application of skills obtained from training, and c) how focusing on design

from the students' experience (QM) vs. focusing on technical skills (TPACK) impacted instructors' TPACK development, course design, and tool adoption choices.

Authentic examples. Research in PBL and professional development programs have found that using authentic examples allows for deeper learning and keeps the instructors invested in training (Capon & Kuhn, 2004; Hernández–Encuentra & Sánchez–Carbonell, 2005; Hinson & Bordelon, 2004; Hmelo-Silver, 2004). This personalized or in depth learning often leads to transfer of knowledge because the construction of knowledge occurs through cognitive associations with what the leaner already knows (Capon & Kuhn, 2004; Derry et al., 2006; Hernandez-Encuentra & Sanchez-Carbonell, 2005; Hmelo-Silver, 2004; Vygotsky, 1978). This, in turn, strengthens the connection between new and existing knowledge.

Findings derived from this current study supports the importance of not just using authentic examples, but also taking advantage of the instructors' prior knowledge or experiences (Mezirow, 1997) by using ones tied specifically to the instructors' discipline (Hinson & LaPrairie, 2005). It also highlights the importance of identifying pedagogical affordances in relation to teaching and technology (Mishra & Koehler, 2006). While recommended best practices were employed during the all training methods, the IT trained faculty lacked an essential component – the use of examples tied specifically to English composition, which would also highlight pedagogical affordances in the technology. While this group had an overview of the tools and were provided with examples of how they could be used, it was not context specific. Without this frame of reference, the IT group either experienced technology diffusion or struggled with effective technology integration (Malikowski et al., 2007). One instructor reportedly found the training to be overwhelming as well.

For the two IT instructors, the absence of a frame of reference to English composition resulted in two occurrences that illustrated the lack of technological pedagogical knowledge (Mishra & Koehler, 2006): a) the novice instructor's perception of successful technology integration was not based on its pedagogical use and b) the veteran instructor's inability to intercede when she encountered challenges with the LMS tool.

Because IT Intructor1 (the GA new to teaching and the technology) was not exposed to an example of how wikis can be used in the peer review process, her perception of 'success' was solely based on the absences of technical issues when creating and using the wikis, not pedagogical considerations. When examining student activity in the wikis in this instructor's course, it was discovered that the wikis were extremely underutilized. Only 2, out of 22, students used the wikis to share their papers with each other.

For the veteran instructor (IT Instructor2), she was able to successfully set up the wiki by providing the students with clear expectations and examples, but still lacked the technological pedagogical knowledge necessary to deal with limitations of the tool. However, unlike the novice IT instructor, she recognized that the tool was not being used effectively. Nevertheless, in contrast to the instructors from the QM and TPACK groups, she was still unable to devise a plan to mitigate these issues or challenges.

On the other hand, two of the QM instructors (both veterans) and two of the TPACK instructors (one novice, one with a little more experience) had the wherewithal to deal with these issues. These QM and TPACK instructors demonstrated TPACK growth through their ability to overcome obstacles. These instructors either a) identified an alternative tool that they could use to accomplish their goals or b) guide the students through using the tools more effectively. As a result of training, these TPACK and QM instructors improved their pedagogical considerations

when integrating technology into teaching (Agyei & Keengwe, 2014; Alsofyani, Aris, Eynon, & Majid, 2012; Mishra & Koehler, 2006; Tømte, Enochsson, Buskqvist, & Kårstein, 2015).

Experience. In addition to the benefits of using authentic examples, it was found that the instructors' levels of experience produced some interesting, and unexpected, findings. Since the veteran instructors had extensive experience with both the technology and teaching, I anticipated no changes would be made to their courses. However, this prior experience proved to be an asset to training. Although they did not adopt as many tools as the novice or TPACK instructors, the QM instructors made more careful decisions on technology choice and use by focusing on a smaller set of tools. They were able to leverage their prior knowledge or experiences to help guide these decisions (Mezirow, 1997). The veteran instructors' knowledge of what students typically struggle with in the writing process allowed them to select appropriate tools to help improve the writing process.

QM Instructor 3, for example, employed techniques to help reduce cognitive load (Paas, Renkl, & Sweller, 2004; Sweller, 1999) that her students typically encounter when taking on the task of writing a research paper. She utilized the journals to break down the research writing process in to more manageable chunks. This also allowed her to provide students with feedback to help guide them through this process as well (Furnborough & Turman, 2009; Pollard, Minor, & Swanson, 2014).

Variations in levels of experience would also account the differences noted in the previous section between the veteran and novice instructor in the IT trained group. Without the background knowledge about what students typically struggle with in English composition, the two instructors' perceptions of successful technology integration differed. This background

knowledge allowed the veteran instructor to identify issues with the pedagogical use of the wikis that went unnoticed by the novice instructor.

Veteran instructors' teaching experience may have been a confounding factor in the impact of training because the QM group was comprised of veteran instructors. Because they had more than 5 years of experience under their belt, they came into training with information that the novice instructors did not possess – already well developed pedagogical knowledge. Their extensive experience in teaching English composition allows them to draw upon that knowledge (Mezirow, 1997). They were able to more easily converge what they know with what was new to them in training.

The novice instructors, on the other hand, may have been preoccupied with not just figuring out the technology, but also how to teach English composition effectively. This cognitive load (Sweller, 1999) might explain why their adoption of more advanced tools were uneven. The new instructors have so much to juggle during their first semester of teaching. Between learning teaching strategies, the technology, and navigating their way through their first semester as a graduate student, it can become quite overwhelming. With all of these new experience competing for cognitive resources (Sweller, 1999), they are more inclined to focus on one over the other. Because most of these courses were taught face to face, utilizing technology to enhance teaching was unlikely a priority at this point.

This is an important aspect to take into consideration when designing training programs. Inundating new instructors with so much information could also lead to technology diffusion and inefficient use of the LMS. This, in turn, could negatively impact long-term use of some of the more advanced LMS tools (Annan, 2008; Barlett & Rappaport, 2009).

Benefits of training. The literature has shown that training should not just focus on improving an individual's technical skills, but should also increase their pedagogical competencies (Keengwe, Kidd, & Kyei-Blankson, 2009; Koszalka & Ganesan, 2004). In this study, I was able to confirm that increasing pedagogical competencies in training was the defining factor for better tool selection, and use, as explained below.

Although the standard IT training helped increase technical knowledge in the instructors, it failed to increase their pedagogical competencies. They were willing to try out new tools they had not used before, but they were unable to consistently successful integrate technology into their teaching. Furthermore, the novice instructor also did not make sound design choices as well.

QM, on the other hand, focused specifically on course design, and not on developing the instructors' technical skills or delivery methods. Although TPACK was implicitly taught, I did observe improvements in TPACK levels for two of these instructors. Careful examination of changes made in courses also revealed that this group made better design and tool choices because they had the students' experiences in mind (Caplow, 2006). Caplow (2006) found this as a useful technique to overcome barriers to technology adoption. One QM instructor (Instructor3) also used the journals tool in a more advanced way compared to the others.

While tool adoption rates in the QM group were slow, tool selection and use was very methodological and practical. By focusing on a few subset of tools, this minimal tool adoption allowed them to evaluate the tool's educational value (Bennett & Bennet, 2003; Butler & Sellbom, 2002; Halawi & McCarthy, 2007; Schrum, 1999). Furthermore, this may have reduced the risk of technology diffusion as they were able to hone in on developing their skills or use of a

particular tool. This leads to technology acceptance and positive attitudes towards training and can serve as a catalyst to eliciting long-term effects of training (Haviland, Turley, & Shin, 2011).

The TPACK training was designed to explicitly enforce increasing instructors' technical skills and technical pedagogical competencies by incorporating activities that foster the instructors' comfort levels and acceptance of the tools (Koh & Divaharan, 2011). The activities included getting to know the content through discussions with the instructors, identifying what they currently do in their English courses and how some of the LMS tools can help them achieve their learning objectives. This was followed up with demonstrations and hands-on practice using the tools.

Although the training was designed to increase technical confidence, I found conflicting results between the TPACK survey and the workshop satisfaction survey for two of the instructors. While the instructors' self-reports show that the workshops made them more comfortable with the LMS and the course analyses revealed they adopted more tools than the other groups, their self-beliefs in their technical skills dropped. TPACK training may have had this negative impact on their self-beliefs, but it yielded positive results in their willingness to try new tools. This is attributed to fostering their comfort levels with the technology and supports findings from previous studies (Bennett & Bennet, 2003; Perreault et al., 2002).

Based on these findings, I believe that TPACK training is an effective way to expose instructors to the various LMS tools and can build their comfort levels in the technology itself. This was illustrated by the increase in the number of LMS tools that the TPACK instructors began using after training (see Figure 3). However, it did not necessarily improve the quality of use. Because the TPACK training is focused on the acceptance of LMS tools and is designed to increase the instructors' technical confidence, less attention is directed at quality of use.

The QM training's focus on improving the quality of courses addressed this deficiency in the TPACK training. I also believe that QM training is more beneficial to more experienced instructors as it provides instructors with essential tools to refine their use of the LMS. As evident in the QM Instructor3's use of the journals to break up the research writing process and cleaning up her course content by deleting unused content. These instructional design choices are aligned with Cognitive Load Theory and Generative Learning Theory as it made the process more manageable for the students. Furthermore, the instructor used the journals to help guide the students through the writing process. The TPACK instructors did not consistently use the tools in these sophisticated ways and not all of them made better course design choices.

The theoretical underpinnings of well designed LMS training is critical to foster not only instructors' tool adoption and course design choices, but facilitates effective use of the LMS. Using learning theories such as constructivism (Piaget, 1936; Vygotsky, 1978) and transformative learning (Mezirow, 1996) to deisgn LMS training allows us to implement strategies that help increase knowledge acquisition and transfer. By leveraging instructional strategies that activate prior experiences and knowledge , we can elicit positive effects of training (Capon & Kuhn, 2004; Derry et al., 2006; Hernandez-Encuentra & Sanchez-Carbonell, 2005; Hmelo-Silver, 2004; Vygotsky, 1978). This includes, but is not limited to, not overwhelming the instructors during training, providing guidance to make appropriate tool selections and design choices, building their comfort levels with the technology, and facilitating the transfer of that knowledge to practice.

Practical Implications

The findings above revealed several implications to the field of LMS training. This includes all facets of training – design, implementation, and evaluation. First and foremost, evaluation of a successful training program must extend beyond just self-repots and self-efficacy scales. As proven in this study, evaluating course changes that occurred after training often revealed a different story than what was in the self-reports. While it is not necessary to conduct it at the same level as this study, following up with changes made by instructors is key to identifying whether or not training was effective.

Secondly, raising pedagogical awareness of the LMS tools is crucial in promoting LMS tool adoption and effective use (Bennett & Bennet, 2003; Malikowski, Thompson, & Thies, 2007; Mishra & Koehler, 2006). To achieve this, I recommended that authentic examples be used to help instructors formulate ideas of how to use the tools tailored specifically to their discipline. I believe making that connection between what typically is done in the classroom and what can be achieved with the available online tools helps foster not only tool adoption, but successful integration of the technology into their curriculum.

However, instead of doing this *during* the workshop, I also recommend that this be done prior to training. This can also help resolve issues with poor attendance/interest in training as it can serve as a mechanism to entice instructors to learn more about the tools. By showcasing how their peers have used the tools, it can emphasize the various pedagogical affordances the LMS, and technology, has to offer.

Thirdly, while the TPACK training incorporates technological, pedagogical, and content knowledge, the reality of training is that one would not always have access to a content expert.

Therefore, it would be difficult to incorporate best practices regarding content delivery across the board. The typical training sessions may not consist of attendees teaching the same subjects.

As discovered in this study, the veteran instructors may have an easier time identifying the pedagogical uses of an LMS because they may have more developed pedagogical and content knowledge versus the new instructors. This knowledge helps them identify pedagogical challenges or limitations related to their specific discipline. In their case, the trainer would serve as a means to bridge that gap between the technology and their pedagogical and content knowledge through discussions. While this is a useful approach for help experienced faculty, there needs to be strategies to also help those less experienced instructors.

Therefore, I recommend providing solutions that will employ scaffolding techniques to address this issue early on in the graduate assistant or new instructor's career. Some graduate programs will offer workshops or classes to guide graduate assistants in teaching strategies. These classes should include a component on technology integration, including the LMS. Through collaborative efforts between pedagogy, content, and technology experts, examples of how technology can enhance learning can be incorporated into these classes.

Scaffolding (Wood, Bruner, & Ross, 1976) can also be used in training when pairing novice instructors with more experienced ones. By allowing these instructors to attend training in tandem, it could potentially also resolve issues with cognitive overload (Sweller, 1999). This could benefit both individuals as it is a means to merge both of their levels of experiences teaching and technology use. For example, the veteran instructor can use their teaching experience to come up with ideas on how to use the technology to enhance learning. While a less experienced instructor who is more comfortable with technology can visualize how to the tools can be implemented, and used.

Limitations

Small sample. This small sample of participants restricts the ability to generalize the results to other populations. However, it does provide insight to what happens in instructors' courses after training. It also provides a better perspective beyond just survey results and provides a more accurate picture of the successful transfer of training concepts to actual practice.

The survey and consent form response rate was quite low from students. So, unfortunately, the examination of the impact of training on students is still lacking. Perhaps incentivizing student participations could have resolved this problem. For example, working with the instructors to offer extra credit for completing the survey. One instructor had done that on his own and almost 100% of the students returned the survey. Another strategy to increase the return rates of the survey could also involve visiting the classes in person to have the students complete the survey at that moment rather than having them complete it online.

Confounding factors. Some confounding factors that may have impacted the results of this study are levels of experience and perhaps generational status. The Quality Matters trained faculty were comprised of mostly experienced instructors over the age of 32 and the TPACK group consisted of less experienced and younger instructors. Identifying levels of experience with teaching and technology as well as age of the participants should have been done early on. This could have been used as an opportunity to better distribute the participants across each training condition.

Conclusion

As an LMS administrator who provides technical support for the learning management system, I am well aware of some the issues and frustrations that instructors encounter when attempting to use an LMS. I used this study to better understand ways to mitigate these problems and negative experiences that instructors face. By identifying these best practices or strategies for LMS training, it can serve as a precedence to better tool adoption and use as well as better course design choices.

Illustrating the pedagogical uses of technology is the key to help instructors make the connection between technology, teaching and pedagogy. This can be done by having a solid theoretical framework based on learning theories to enhance LMS training design. Knowledge acquisition and application can be strengthened through the use of authentic examples and activating previous experience. These features can make the learning process less daunting and can reduce negative experiences that often surface when attempting to learn new skills.

Learning how to incorporate technology into teaching is a transformative process (Mezirow, 1997). It should start with the basics – exposure to the available tools and increasing technical confidence in instructors. This increase in confidence can to the likelihood of wanting to try new LMS tools. Once that is achieved, instructors are better equipped to refine their use of the technology through guidance from a tool like the QM rubric.

Future researchers should continue to explore the impact of training on student retention and outcomes as this study was unable to explore this phenomenon. A longitudinal study that follows the instructor for more than a semester could be useful in studying the long-term effects of training – whether or not the instructor continues to apply what they learned. In addition to a

long-term study, comparing how training impacts novice vs. veteran teachers who attend training could give insight to how these different groups apply what they learned. Understanding this phenomenon could help us design effective training for both groups.

I think it is important to also explore some of the differences in the impact of training as a result of various levels of not only teaching or technology experience, but generational experiences as well. It would be interesting to explore whether or not novice instructors can make sense of and successfully implement the Quality Matters rubric.

Appendices

Appendix A: Quality Matters Rubric

TPACK Category	Quality Matters Standards	QM Weight
	Category 1: Course Overview and Introduction	
PK*	1.1 Instructions make clear how to get started and where to find various course components.	3
TPCK	1.2 Learners are introduced to the purpose and structure of the course.	3
TPK	1.3 Etiquette expectations (sometimes called "netiquette") for online discussions, email, and other forms of communication are clearly stated.	2
PK*	1.4 Course and/or institutional policies with which the learner is expected to comply are clearly stated, or a link to current policies is provided.	2
TK	1.5 Minimum technology requirements are clearly stated and instructions for use provided.	2
CK	1.6 Prerequisite knowledge in the discipline and/or any required competencies are clearly stated.	1
TK	1.7 Minimum technical skills expected of the learner are clearly stated.	1
TPK	1.8 The self-introduction by the instructor is appropriate and is available online.	1
PK	1.9 Learners are asked to introduce themselves to the class.	1
	Category 2: Learning Objectives	
PK	2.1 The course learning objectives, or course/program competencies, describe outcomes that are measurable.	3
PK/PCK	2.2 The module/unit learning objectives or competencies describe outcomes that are measurable and consistent with the course-level objectives or competencies.	3
PK	2.3 All learning objectives or competencies are stated clearly and written from the learner's perspective.	3
PK	2.4 The relationship between learning objectives or competencies and course activities is clearly stated.	3
PK	2.5 The learning objectives or competencies are suited to the level of the course.	3

	Category 3: Assessment and Measurement	
PCK	3.1 The assessments measure the stated learning objectives or competencies.	3
PK	3.2 The course grading policy is stated clearly.	3
PCK	3.3 Specific and descriptive criteria are provided for the evaluation of learners' work and are tied to the course grading policy.	3
PCK	3.4 The assessment instruments selected are sequenced, varied, and suited to the learner work being assessed.	2
PK	3.5 The course provides learners with multiple opportunities to track their learning progress.	2
	Category 4: Instructional Materials	
PCK	4.1 The instructional materials contribute to the achievement of the stated course and module/unit learning objectives or competencies.	3
PK	4.2 Both the purpose of instructional materials and how the materials are to be used for learning activities are clearly explained.	3
PCK	4.3 All instructional materials used in the course are appropriately cited.	2
CK	4.4 The instructional materials are current.	2
CK	4.5 A variety of instructional materials is used in the course.	2
PK*	4.6 The distinction between required and optional materials is clearly explained.	1
	Category 5: Learner Interaction and Engagement	
PCK	5.1 The learning activities promote the achievement of the stated learning objectives or competencies.	3
PK	5.2 Learning activities provide opportunities for interaction that support active learning.	3
PK	5.3 The instructor's plan for classroom response time and feedback on assignments is clearly stated.	3
PK	5.4 The requirements for learner interaction are clearly stated.	2
	Category 6: Course Technology	
TCK	6.1 The tools used in the course support the learning objectives and competencies.	3
TPK	6.2 Course tools promote learner engagement and active learning.	3
TCK	6.3 Technologies required in the course are readily obtainable.	2
TPK	6.4 The course technologies are current.	1
TK	6.5 Links are provided to privacy policies for all external tools required in the course.	1
	Category 7: Learner Support	
PK	7.1 The course instructions articulate or link to a clear description of the technical support offered and how to obtain it.	3
TPK	7.2 Course instructions articulate or link to the institution's accessibility policies and services.	3
PCK	7.3 Course instructions articulate or link to an explanation of how the institution's academic support services and resources can help learners succeed in the course and how learners can obtain them.	2
PCK	7.4 Course instructions articulate or link to an explanation of how the institution's student services and resources can help learners succeed and how learners can obtain them.	1

	Category 8: Accessibility	
PK*	8.1 Course navigation facilitates ease of use.	3
TPK	8.2 Information is provided about the accessibility of all technologies required in the course.	3
TPK/TK	8.3 The course provides alternative means of access to course materials in formats that meet the needs of diverse learners.	2
TPK/TK	8.4 The course design facilitates readability.	2
TK*	8.5 Course multimedia facilitate ease of use.	2

Note: TPACK domains – CK = Content Knowledge, PK = Pedagogical Knowledge, TK = Technical Knowledge, TCK = Technological Content Knowledge, TPK = Technological Pedagogical Knowledge, PCK = Pedagogical Content Knowledge, and TPACK = Technological Pedagogical Content Knowledge.

Appendix B: TPACK Survey

Thank you for taking time to complete this questionnaire. Please answer each question to the best of your knowledge. Your thoughtfulness and candid responses will be greatly appreciated.

DEMOGRAPHIC INFORMATION

1. Your name

2. Teaching assignment(s) for Fall 2015:

3. Gender
   a. Female
   b. Male

4. Age range
   a. 18-22
   b. 23-26
   c. 27-32
   d. 32+

5. Your teaching role
   a. Full-time professor
   b. Adjunct or part-time faculty
   c. Graduate teaching assistant

6. How long have you been using WebCampus (Blackboard) as an instructor?
   a. 0 – This is my first time using WebCampus
   b. 1 year or less
   c. 2-5
   d. 5+
7. How long have you been teaching English?
   a. 0 – This is my first time teaching this course
   b. 1 year or less
   c. 2-5
   d. 5+

Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, WebCampus, etc. Please answer all of the questions and if you are uncertain of or neutral about your response you may always select "Neither Agree or Disagree"

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
TK (Technology Knowledge)					
1. I know how to solve my own technical problems.					
2. I can learn technology easily.					
3. I keep up with important new technologies.					
4. I frequently play around the technology.					
5. I know about a lot of different technologies.					
6. I have the technical skills I need to use technology.					
CK (Content Knowledge)					
7. I have sufficient knowledge about critical thinking, reading, and writing.					
8. I have a deep understanding of the fundamentals of composing well structured, evidence based essays.					
9. I have various ways and strategies of developing my understanding of how to improve my critical thinking and writing skills.					
PK (Pedagogical Knowledge)					
10. I know how to assess student performance in a classroom.					
11. I can adapt my teaching based-upon what students currently understand or do not understand.					
12. I can adapt my teaching style to different learners.					
13. I can assess student learning in multiple ways.					
14. I can use a wide range of teaching approaches in a classroom setting.					
15. I am familiar with common student understandings and misconceptions.					
16. I know how to organize and maintain classroom management.					
PCK (Pedagogical Content Knowledge)					
17. I can select effective teaching approaches to guide student thinking and learning in writing					
TCK (Technological Content Knowledge)					

18. I know about technologies that I can use for understanding and composing essays.					
19. I know about technologies that I can use for developing critical thinking skills.					

TPK (Technological Pedagogical Knowledge)					
20. I can choose technologies that enhance the teaching approaches for a lesson.					
21. I can choose technologies that enhance students' learning for a lesson.					
22. My graduate education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.					
23. I am thinking critically about how to use technology in my classroom.					
24. I can adapt the use of the technologies that I am learning about to different teaching activities.					
25. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.					
26. I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom.					
27. I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district.					
28. I can choose technologies that enhance the content for a lesson.					

TPACK (Technology Pedagogy and Content Knowledge)					
29. I can teach lessons that appropriately combine English composition, technologies and teaching approaches.					

Models of TPACK (Faculty, PreK-6 teachers)					
30. My graduate education professors appropriately model combining content, technologies and teaching approaches in their teaching.					

Please complete this section by writing your responses in the boxes.

31. Describe a specific episode where you effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content you taught, what technology you used, and what teaching approach(es) you implemented. If you have not had the opportunity to teach a lesson, please indicate that you have not.

Appendix C: TPACK Post-Survey Additional Questions

1. During or after you participated in WebCampus training, did you do any of the following:
    a. Make design changes to the layout of my course
    b. Utilize a WebCampus tool that you have never used before (e.g. discussions, journals, etc.)
    c. Did not make any changes to my course(s) for this semester.

Based on the answers selected for question 1, the following open ended questions were asked:

If a & b were selected:

2. How did you decide to use the tool(s) that you never used?
3. How does the tool you used align with your pedagogical approach for teaching English?
4. Did the technology work like you intended it to work? If not, how did you deal with it?
5. What will you do differently if you use the tool again in future years?

If c was selected:

2. What were some reasons why you decided not to make any changes to your course?
3. What changes, if any, would you make for future semesters if (barriers indicated in the previous question) did not exist?

Appendix D: Post-Workshop Satisfaction Survey

We would very much appreciate your feedback on the workshops we offered. It should only take a few minutes of your time and it will help us improve existing workshops and perhaps give us ideas for new ones!

Questions 1 through 9 will be based on a Likert Scale:
1 - Strongly Disagree
2 - Disagree
3 - Neutral
4 – Agree
5 – Strongly Agree

1. The content presented was appropriate for the workshop(s) I attended.
2. The time allotment was appropriate for the workshop(s).
3. The delivery methods used by the instructor (via class examples and printed materials) enabled me to retain the concepts and skills presented.
4. Overall, the workshop I attended was valuable to me.
5. The instructor presented the material clearly.
6. The instructor created a positive atmosphere for learning.
7. The instructor used helpful exercises and/or examples to illustrate the primary concepts being discussed.
8. The workshop manuals/handouts are informative and helpful as a reference.
9. I have used the workshop manual(s) for reference after class.

Note: Questions 10-12 will be open ended questions. An essay text box will be provided for each response.

10. Please add any additional comments you have regarding the workshops, instructors, learning resources, facilities, schedule, etc. Any suggestions or other comments are welcome and appreciated.

The next two questions will help the researcher gauge any changes made to your courses during your training.

11. In the space provided below, indicate a numbered list of the changes you made to your course.

12. Looking at the changes above, provide an explanation for why you made each change.

Appendix E: Sample Notes for Course Analyses

Notes
Instructor 3
Total navigation/organization changes:- Reorganized course content into Learning Modules & folders after training.
Total content changes: Utilized journals to help with writing process, changed regular assignments into Turnitin assignments,
New tools: 2 - Journals and Turnitin

Pre	Midsemester	Final
Course Menu (Navigation)		
Announcements Course Content Course Messages Quizzes Assignment Dropbox My Grades Library Guide Resources ~~Start Here (hidden)~~ ~~Course Notifications (hidden)~~ ~~Communications (Hidden)~~ ~~Discussion Board (hidden)~~ ~~Tools (Hidden)~~ ~~Information for Instructors (hidden)~~ ~~Discussions (Hidden)~~ ~~Email (Hidden)~~	Announcements Course Content Course Messages Quizzes Assignment Dropbox My Grades Library Guide Resources ~~Start Here (hidden)~~ ~~Course Notifications (hidden)~~ ~~Communications (Hidden)~~ ~~Discussion Board (hidden)~~ ~~Tools (Hidden)~~ ~~Information for Instructors (hidden)~~ ~~Discussions (Hidden)~~ ~~Email (Hidden)~~ ~~Journals~~	No changes
Course Content (Content Area)		
Syllabus: Class Policies Fall 2015 (File) Syllabus: Weekly Assignment Fall 2015 (File) **WRITING PROJECT #1 (Folder)** Synthesis Description (File) Synthesis PPP (File) MLA Formatting (Link) Attribution Verbs (Link) Essay Elements (File) The Writing Process on Quiz #1 (File) Notes on the Writing Process on Quiz #1(File) Read Reason Write Chapter 1(File) Read Reason Write Chapter 2 (File) **WRITING PROJECT #2 (Folder) (hidden)** **WRITING PROJECT #3 (Folder) (hidden)** **WRITING PROJECT #4 (Folder)** TOPIC PROPOSAL(File) (hidden)	Reorganized content area and created new Learning modules Syllabus: Part I & II (LM) (Moved syllabus files to here) Quizzes (LM) Journals (LM) (New tool) Supplemental Material (LM) (Moved files to here) WRITING PROJECT #1 (Folder) WRITING PROJECT #2 (Folder) WRITING PROJECT #3 (Folder) WRITING PROJECT #4 (Folder) PRESENTATION GUIDELINES AND SCHEDULE (Folder) FINAL EXAM ESSAY AND PROMPT (Folder)	Added 2 minute anonymous survey & added description to Final Exam Essay folder

PRESENTATION GUIDELINES AND SCHEDULE (Folder) **FINAL EXAM ESSAY AND PROMPT (Folder)** LIBRARY TUTORIAL QUIZ (Test) (hidden) LIBRARY TUTORIALS (Link) CONNECT 2.0: Writing Matters eBook 800-331-5094 (Link)		
Syllabus: Part I and II (LM)		
•	Syllabus: Class Policies Fall 2015 (File) Syllabus: Weekly Assignment Fall 2015 (File)	
Quizzes (LM)		
Quiz 2 & 3	Quizzes 4-6 (Tests)	Added Quizzes 9-13 (Journals) (New tool)

Appendix F: End of Semester Student Satisfaction Survey

Questions adapted from Ralston Berg (2014) will be based on a Likert Scale:
1 - Strongly Disagree
2 - Disagree
3 - Neutral
4 - Agree
5 – Strongly Agree

1. I am satisfied with the organization of this WebCampus course.
2. I am satisfied with how easy it was to find course content and activities (tests, assignments, etc.) in WebCampus.
3. The WebCampus tools selected for the activities in this course was appropriate.
4. I am satisfied with the clarity of instructions provided by the instructor on how to complete assignments for this course.
5. I am satisfied with the response time from the instructor.

Appendix G: IT Training Agenda & Guide

Welcome to Get Organized!

By the end of this course you will be able to:

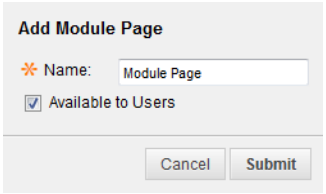
1. Modify your course menu
2. Identify the differences between Learning Modules and Course Folders
3. Develop a plan on how to best organize your course
4. Create a Learning Module or Folder
5. Identify different types of files that can be added to your course

---

Course Menu

Adding A Course Menu Item

1. Make sure that Edit Mode is ON  in the course.
2. From the navigation panel on the left, mouse over the plus sign () and select the type of menu item you would like to add. (Example: Module page)
3. In the Name field, enter your preferred menu item name.
4. Check the box next to Available to Users, if you would like to make the menu item visible to students.



5. Click Submit when finished.

Removing a Course Menu Item

Note: This process cannot be undone so please check to make sure there is no content under the Course Menu Item before you proceed.

1. Make sure that Edit Mode is **ON**  in the course.
2. From the navigation panel on the left, mouse over the item you want to remove.
3. Click on the gray circle to the right of the item
4. Select **Delete**
5. Click **OK** to delete the item.

Planning Content Areas

Plan how you will organize the entire course and envision how your course menu will look and function. Three common organizational approaches are chronologically, by content type, and by subject area.

Chronological	**By Content Type**	**By Subject Area**
Week 1 Week 2 Week 3	Lectures Readings Assignments	Getting Started Learning Theories Development Motivation
Each content area contains a week's worth of readings, assignments, lecture notes, and discussion forums.	*Similar content types are grouped together in a content area, such as all the lectures for the entire course.*	*Each content area contains lecture material and readings on a specific subject, along with assignments, discussion forums, and tests.*

Appendix H: TPACK Training Agenda & Guide

Note: All TPACK training sessions consisted of 1 attendee only so training was customized to accommodate this.

Items in {} and in italics are unique to TPACK training

Welcome to Get Organized!

By the end of this course you will be able to:

1. Modify your course menu
2. Identify the differences between Learning Modules and Course Folders
3. Develop a plan on how to best organize your course *{based on their goals for the course}*
4. Create a Learning Module or Folder
5. Identify different types of files that can be added to your course
   {Emphasis on supplementary material that can aid in the writing process]

[NOTE: Instructions for adding/removing menu items (see Appendix G) were also included, but omitted in this example]

==========

Due to the one on one training, in depth discussions were conducted prior to diving into the technical demonstrations and hands-on practice.

Discussions were based on the following:

1. Examination of syllabus to identify
   a. Resources
   b. Activities
   c. Concepts being taught
2. What is currently being done in the classroom to facilitate learning?
3. What are some items or concepts that learners have trouble with?

Based on these discussions we identified:

1. How to organize the course materials that would be appropriate for the instructor
2. How the instructor intended to use the LMS and suggestions for improvement

When utilizing hands-on practice, several checks were made to ensure instructors were comfortable with the technology before moving on.

Appendix I: QM Training Agenda

Note: Items in { } are unique to QM training

Welcome to Get Organized!

By the end of this course you will be able to:

1. Modify your course menu
2. Practice using the Quality Matters Rubric to evaluate examples of course folders/menus.
3. Use the Quality Matters Rubric to guide your course design choices
4. Identify the differences between Learning Modules and Course Folders
5. Develop a plan on how to best organize your course
6. Create a Learning Module or Folder
7. Identify different types of files that can be added to your course

Quality Matters Rubric

Criteria to keep in mind for course organization:

Course Overview
1.2: Learners are introduced to the purpose and structure of the course

Instructional Materials
4.1: The instructional materials contribute to the achievement course objectives/competencies
4.2: Purpose of instructional materials and how the materials are to be used are clearly explained.
4.3: All instructional materials used in the course are appropriately cited
4.4: The instructional materials are current
4.5: A variety of instructional materials are used in the course
4.6: The distinction between required and optional materials are clear

Accessibility and Usability
8.1: Course navigation facilitates ease of use
8.4: The course design facilitates readability

Course Menu

Your course menu will be used by yourself and students to navigate around your course. It is important to not only keep the menu organized, but also provide students with instructions on how to find specific items in your course through the use of this course menu.

Tip: Keep your students' experience in mind as you add/remove items on the course menu.

(Continued on next page)

Examples of Course Menus:

Would you rate these as good/needs improvement? What would you change? [Walked instructors through using the QM Rubric]

Example 1	Example 2	Example 3
DEMO 101 1001 – 2015 Fall Announcements Syllabus Start Here Course Content Tools Discussions Blogs Journals Tests Assignments Chapter 1 Chapter 2 Chapter 3 My Grades	**DEMO 101 1001 – 2015 Fall** Announcements Start Here Course Content My Grades	**DEMO 101 1001 – 2015 Fall** Announcements Start Here Course Content Course Messages Discussions My Grades Resources

[NOTE: Instructions for adding/removing menu items (see Appendix G) were also included, but omitted in this example]

Planning Content Areas

Plan how you will organize the entire course and envision how your course menu will look and function. Three common organizational approaches are chronologically, by content type, and by subject area.

Chronological	By Content Type	By Subject Area
Week 1 Week 2 Week 3	Lectures Readings Assignments	Getting Started Learning Theories Development Motivation
Each content area contains a week's worth of readings, assignments, lecture notes, and discussion forums.	*Similar content types are grouped together in a content area, such as all the lectures for the entire course.*	*Each content area contains lecture material and readings on a specific subject, along with assignments, discussion forums, and tests.*

Questions to consider (Conducted as a discussion)

1. What is the best way to divide the course material into manageable sections?
2. Do you want course materials presented in chronological order, by textbook chapter, or by subject area?
3. Do you want each unit to follow a predictable pattern? For example, you can include reading materials followed by a quiz and a discussion board wrap-up.
4. Do you want students to move through your course material sequentially, non-sequentially, or a mixture of both?

{ Review changes using the criteria on page 1 }

Appendix J: Complementary Analysis Research Matrix CARMA

Complementary Analysis Research Matrix (CARMA)

		IT		
		Instructor 1	**Instructor 2**	**Instructor 3**
	Role	TA	FT	PTI
	Experience (Tech)	0	5+	5+
	Experience (Teaching)	0	5+	5+
	Age	Over 32	Over 32	Over 32
	Template?	X		X
Expectations				
(QM would make more organizational/course design changes)	Course Design	Did not utilize template content except for assignments		*Used Weekly Learning Modules. Did not use template content
	Course Menu	1. Unhide 1 menu item (Assignments)	1. Unhide 1 menu item (wikis) and moved link	None
	Course Changes	Mid-semester: 1. Added 1 folder 2. Added new content (11) 3. Added new activities (9) 4. Moved 2 items End of semester: 5. Added 1 folder, 1 subfolder 6. Added new content (8) 7. Added new activities (8) 8. Removed 1 item	End of semester 1. Added new activities (6)	Training to Mid-semester 1. Added 7 new folders** Mid-semester to end of semester 2. Added 5 folders** **However, this matches his design from a previous semester prior to training. Not a result of attending training.
(TPACK would adopt more	Tool Adoption	1. Wikis 2. Groups	1. Wikis	None
	Why tool selected?	Learned about tools in training To enhance class interactions and learning (student-student & student-instructor)	Increase student involvement and how they presented content. Wanted students to learn on their own & each other	
	Did the technology work like you intended it to work? If not, how did you deal with it?	Yes it did work.	It didn't work as well as I hoped, so I'm not sure how to get the students to use it better.	

		QM		
		Instructor 1	**Instructor 2**	**Instructor 3**
	Role	PTI	PTI	PTI
	Experience (Tech)	2 to 5	5+	5+
	Experience (Teaching)	5+	5+	5+
	Age	Over 32	Over 32	Over 32
	Template?			
Expectations				
(QM would make more organizational/course design changes)	Course Design			
	Course Menu	1. Hid menu items not using (1) 2. Removed 1 tool link that she was not using for the course	1. Added 1 new tool link (Calendar) to menu 2. Rearranged menu items (2)	1. Added 1 tool link (Journals) 2. Moved 2 line dividers
	Course Changes	Mid-semester 1. Added new folders (3) for better organization of content by project 2. Added new content to content areas (7) 3. Added new assessments (3); 1 not available End of semester: 4. Added 1 item 5. Removed 1 file 6. Made 1 assignment available	Mid-semester: 1. Added 3 new folders to Course Content area (by task); 1 subfolder 2. Added 15 files 3. Added 9 new activities* End of semester 4. Added 1 folder 5. Added 6 files (to top of course content) 6. Added 2 new activities* *Started using Turnitin and switched to regular assignments due to technical problems	Mid-semester 1. Added 4 learning modules (content type) 2. Added new content items (11) 3. Reorganized course content by moving content (11) 4. Removed items not using (7) 5. Added activities (9) 6. Changed tools for assignment (2) End of semester: 7. Added 1 new file 8. Added 13 new activities
(TPACK – new tools would be adopted)	Tool Adoption	1. Journal (for 1 activity, not graded)	1. Turnitin Paper Assignment 2. Turnitin Peer Mark (peer review) 3. Assignment Dropbox	1. Journals (7 total) for writing process 2. Turnitin
	Why did you choose these new tools?	Thought it would be a good tool for revision/writing evaluation activities	For student-student and student-teacher interactions in process of writing papers	Help students with the writing process for a research project. Allowed for both individual & group work.
	Did the technology work like you intended it to work? If not, how did you deal with it?	It worked well for most students.	No, I constantly had difficulties with TurnItIn in that students could not always access comments from other students on their assignments and it would be great to have one place where everyone could comment on one document so that a student could pull up the paper and see in-text comments from everyone.	Yes, very much so. Because the task required small units of writing, I was immediately, the same day, identify student performance problems and provide individual feedback. Students gained confidence in essay writing, the construction of arguments, and expressing their ideas logically and in a compelling fashion.

		TPACK		
		Instructor 1	**Instructor 2**	**Instructor 3**
	Role	TA	PTI	PTI
	Experience (Tech)	0	2 to 5	5+
	Experience (Teaching)	0	2 to 5	5+
	Age	27-32	27-32	27-32
	Template?	X		
Expectations				
(QM would make more organizational/course design changes)	Course Design			
	Course Menu	1. Hid menu items not used (3) 2. Unhide Assignments 3. Moved 3 items	None	1. Added new menu items (5) (Content area based on project types) 2. Moved items (1)
	Course Changes	Mid-semester: 1. Added 5 folders by week & 2 subfolders 2. Added new content (17) 3. Added new activities (7) End of semester 4. Added new activities (11) Pre-training – used announcements to organize everything. Post training – started using folders. End of semester – started using announcements again	Mid-semester: 1. Added 5 new folders in Course Content by content type 2. Moved items from Course Content (6) 3. Added new content (15) 4. Added new activities (5) End of semester: 5. Added new content (3) 6. Added new activities (6)	Mid-semester 1. Added 2 new content areas/folders and 2 subfolders (Did not use course content) 2. Added new content (17) 3. Added new activities/tools (7) End of semester 4. Changed and moved 1 item 5. Added new folders/content areas (2) 6. Added new content (7) 7. Added new activities (3)
(TPACK would adopt more tools)	Tool Adoption	1. Blogs (pre-training) 2. Assignments 3. Folders 4. Grade Center (part of template) 5. Discussions (with peer review)	1. Journals 2. Folders 3. Turnitin 4. Youtube Mashups 5. Grade Center	1. Assignments 2. Discussions 3. Grade center 4. Weblinks 5. Items
	Why did you choose these new tools?	Wanted students to communicate and be resources for each other. Wanted to empower students' to access extra resources when needed. Was able to curate and organize these extra resources to provide ease of access to students.	Improve organization. More familiar with grading & assessment tools. Grading is quicker, course content better organized – improving student experience, and journaling allows students to warm up with their own voice and writing styles	N/A
	Did the technology work like you intended it to work? If not, how did you deal with it?	yes it does -- although it is clunky at times. There are more steps involved with most things than there are in more popular software such as Google platforms.	Yes.	

References

Agyei, D. D., & Keengwe, J. (2014). Using technology pedagogical content knowledge development to enhance learning outcomes. *Education and Information Technologies, 19*(1), 155-171.

Alsofyani, M. M., Aris, B. B., Eynon, R., & Majid, N. A. (2012). A Preliminary evaluation of short blended online training workshop for TPACK development using Technology Acceptance Model. *Turkish Online Journal of Educational Technology-TOJET, 11*(3), 20-32.

Annan, D. L. (2008). Facilitating adoption of technology in higher education. *Distance Learning, 5*(1), 13-17.

Backer, P. (2001). Models for faculty training in technology. *EDUCAUSE Annual Conference 2001.*

Ballenger, N., Templeton, N. R., & Thompson, J. (2018). Examining quality elements in a high education fully online doctoral program: Doctoral students' perceptions. *International Journal of Educational Leadership Preparation, 13*(1), 51-63.

Barlett, P. F., & Rappaport, A. (2009). Long-term impacts of faculty development programs: Experience of tell and piedmont. *College Teaching, 57*(2), 73-82.

Bennett, J., & Bennet, L. (2003). A review of factors that influence the diffusion of innovation when structuring a faculty training program. *The Internet and Higher Education, 6*(1), 53-63.

Blackboard Learn. (2009). Blackboard Inc. New York: McGraw Hill.

Bogle, G., Cook, V., Day, S., & Swan, K. (2009). Blended program development: applying the quality matters and community of inquiry frameworks to ensure high quality design and implementation. *Journal of the Research Center for Educational Technology, 5*(2), 51-66.

Brunken, R., Steinbacher, S., Plass, J. L., & Leutner, D. (2002). Assessment of cognitive load within multimedia learning by the dual task methodology. *Experimental Psychology, 49*, 109-119.

Butler, D. L., & Sellbom, M. (2002). Barriers to adopting technology. *Educause Quarterly, 2*, 22-28.

Caplow, J. (2006). Where do I put my course materials? *Quarterly Review of Distance Education, 7*(2), 165-173.

Capon, N., & Kuhn, D. (2004). What's so good about problem-based learning? *Cognition & Instruction, 22*(1), 61-79.

Creswell, J. W., & Plano Clark, V. I. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage Inc.

Davis, D., Chen, G., Hauff, C., & Houben, G. J. (2018). Activating learning at scale: A review of innovations in online learning strategies. *Computers & Education, 125*, 327-344.

Derry, S. J., Hmelo-Silver, C. E., Nagarajan, A., Chernobilsky, E., & Beitzel, B. D. (2006). Cognitive transfer revisited: Can we exploit new media to solve old problems on a large scale? *Journal of Educational Computing Research, 35*(2), 145-162.

Deutsch, M. (1949). A theory of cooperation and competition. *Human Relations, 2*, 129-152.

Eggen, P., & Kauchak, D. (2012). *Educational psychology: Windows on classrooms* (9th ed.). Upper saddle River, NJ: Pearson.

Furnborough, C., & Turman, M. (2009). Adult beginner distance language learner perceptions and use of assignment feedback. *Distance Education, 30*(3), 339-418.

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38*(4), 915-945.

Gast, I., & Van Der Veen, J. (2017). Team-based professional development interventions in higher education: A systematic review. *Review of Educational Research, 87*(4), 736-767.

Green, K. C. (2010). *The 2010 campus computing survey.* Retrieved from http://www.campuscomputing.net/summary/2010-campus-computing-survey

Green, K. C. (2014). *The 2014 campus computing survey.* Retrieved from http://www.campuscomputing.net/item/campus-computing-2014

Greer, D. L., Crutchfield, S. A., & Woods, K. L. (2013). Cognitive theory of multimedia learning, instructional design principles, and students with learning disabilities in computer-based and online learning environments. *Journal of Education, 193*(2), 41-50.

Halawi, L., & McCarthy, R. (2007). Measuring faculty perceptions of blackboard using the technology acceptance model. *Issues in Information Systems, 8*(2), 160-165.

Haviland, D., Turley, S., & Shin, S. (2011). Changes over time in faculty attitudes, confidence, and understanding as related to program assessment. *Issues in Teacher Education, 20*(1), 69-84.

Hernandez-Encuentra, E., & Sanchez-Carbonell, J. (2005). The bologna process and lifelong education: Problem-based learning. *Higher Education in Europe, 30*(1), 81-88.

Hernández–Encuentra, E., & Sánchez–Carbonell, J. (2005). The Bologna process and lifelong education: Problem–based learning. *Higher Education in Europe, 30*(1), 81-88.

Hinson, J. M., & Bordelon, R. S. (2004). Professional development recommendations for online course designers. In C. Cavanaugh, *Development and management of virtual schools: Issues and trends* (pp. 135-157). Hershey, PA: Information Science Publishing.

Hinson, J. M., & LaPrairie, K. N. (2005). Learning to teach online: Promoting success through professional development. *Community College Journal of Research and Practice, 29*(6), 483-493.

Hmelo-Silver, C. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*(3), 235-266.

Holmes, K. a., & Prieto-Rodriguez, E. (2018). Student and staff perceptions of a learning management system for blended learning in teacher education. *Australian Journal of Teacher Education, 43*(3), 21-34.

Irani, T., & Telg, R. (2007). Building it so they will come: Assessing universities' distance education faculty training and development programs. *International Journal of E-Learning & Distance Education, 17*(1), 36-46.

Jacobsen, D. M. (1998). *Adoption patterns of faculty who integrate computer technology for teaching and learning in higher education.* Paper presented at 98 World Conference on Educational Multimedia and Hypermedia and World Conference on Educational Telecommunications. Freiberg, Germany. Retrieved from http://files.eric.ed.gov/fulltext/ED428675.pdf

Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance? *Computers & Education, 95*, 270-284.

Johnson, D. W., & Johnson, R. T. (2008). Social interdependence theory & cooperative learning: The teacher's role. In R. M. Gillies, *The teacher's role in implementing cooperative*

learning in the classroom. Computer-supported collaborative learning. Boston, MA: Springer.

Johnson, D. w., Johnson, R. T., & Smith, K. (2013). Cooperative learning: Improving university instruction by basing practice on validated theory. *Journal on Excellence in University Teaching*, 1-26.

Johnson, T., Wisniewski, M. A., Kuhlemeyer, G., Isaacs, G., & Krzykowski, J. (2012). Technology adoption in higher education: Overcoming anxiety through faculty bootcamp. *Journal of Asynchronous Learning Networks, 16*(2), 63-72.

Kagima, L. K., & Hasafus, C. O. (2001). Faculty: The central element in instructional technology integration. *Journal of Family & Consumer Sciences, 93*(4), 33-36.

Kalyuga, S. (2012). Interactive distance education: A cognitive load perspective. *Journal of Computing in Higher Education, 24*(3), 182-208.

Katz, Y. J. (2002). Attitudes affecting college students' preferences for distance learning. *Journal of Computer Assisted Learning, 18*(1), 2-9.

Kear, K., Chetwynd, F., & Jefferis, H. (2014). Social presence in online learning communities: The role of personal profiles. *Research in Learning Technology, 22*.

Keengwe, J., Kidd, T., & Kyei-Blankson, L. (2009). Faculty and technology: Implications for faculty training and technology leadership. *Journal of Science Education and Technology, 18*(1), 23-28.

Kennedy, M. M. (2016). How does professional development improve teaching? *Revew of Educational Research, 86*(4), 945-980.

King, F. B. (2002). A virtual student: Not an ordinary Joe. *Internet and Higher Education, 5*, 157-166.

Kirkwood, A., & Price, L. (2013). Examining some assumptions and limitations of research on the effects of emerging technologies for teaching and learning in higher education. *British Journal of Educational Technology, 44*(4), 536-543.

Klene, B. A. (2013). Online course design–An analysis of student feedback related to Quality Matters™ standards. *Journal of Research in Business Information Systems, 6*(6), 21-30.

Koh, J. H., & Divaharan, S. (2011). Developing pre-service teachers' technology integration expertise through the TPACK-developing instructional model. *Journal of Educational Computing Research, 44*(1), 35-58.

Kong, S. C. (2014). E-learning in school education in the coming 10 years for developing 21st century skills: Critical research issues and policy implications. *Educational Technology & Society, 17*(1), 70-78.

Koszalka, T. A., & Ganesan, R. (2004). Designing online courses: A taxonomy to guide strategic use of features available in course management systems (CMS) in distance education. *Distance Education, 25*(2), 243-256.

Lang, C., Craig, A., & Casey, G. (2017). A pedagogy for outreach activities in ICT: Promoting peer to peer learning, creativity and experimentation. *British Journal of Educational Technology, 48*(6), 1491-1501.

Lee, Y., & Choi, J. (2011). A review of online course dropout research: implications for practice and future research. *Educational Technology Research & Development, 59*, 593-618.

Legon, R., & Runyon, J. (2007). *Research on the impact of the quality matters course review process.* Paper presented at 23rd Annual Conference on Distance Teaching & Learning. Madison, WI. Retrieved from http://www uwex edu/disted/conference/Resource_library/proceedings/07_5284 pdf

Leh, A. (2005). Lessons learned from service learning and reverse mentoring in faculty development: A case study in technology training. *Journal of Technology & Teacher Education, 13*(1), 25-41.

Ley, K., & Gannon-Cook, R. (2014). Learner-valued interactions. *Quarterly Review of Distance Education, 15*(1), 23-32.

Malikowski, S. R. (2010-2011). A three year analysis of CMS use in resident university courses. *Journal of Educational Technology Systems, 39*(1), 65-85.

Malikowski, S. R., Thompson, M. E., & Thies, J. G. (2007). A model for research into course management systems: Bridging technology and learning theory. *Journal of Educational Computing Research, 36*(2), 149-173.

Mayer, R. E. (1999). *The promise of educational psychology: Learning in the content areas.* Upper Saddle River, NJ: Prentice-Hall.

Mazzolini, M. &. (2007). When to jump in: The role of the instructor in online discussion forums. *Computers and Education, 49*(2), 193-213.

Merriam, S. B. (2002). *Qualitative Research in Practice: Examples for Discussion and Analysis.* San Francisco CA: Jossey-Bass.

Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education, 1997*(74), 5-12.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017-1054.

Mohr, S. C., & Shelton, K. (2017). Best practices framework for online faculty professional development: A Delphi study. *Online Learning Journal, 21*(4), 123-140.

Morgan, G. (2003). Faculty use of course management systems. *EDUCAUSE Center for Applied Research.* Boulder, CO.

Ozkal, K., Tekkaya, C., Cakiroglu, J., & Sungur, S. (2009). A conceptual model of relationships among constructivist learning environment perceptions, epistemological beliefs, and learning approaches. *Learning and Individual Differences, 19*, 71-79.

Paas, F., Renkl, A., & Sweller, J. (2004). Cognitive Load Theory: Instructional implications of the interaction between information structures and cognitive architecture. *Instructional Science, 32*, 1-8.

Pena-Shaff, J., & Altman, W. (2015). Student interaction and knowledge construction in case-based learning in educational psychology using online discussions: The role of structure. *Journal of Interactive Learning Research, 26*(3), 307-329.

Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. P. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal, 44*(4), 921-958.

Perreault, H., Waldman, L., Alexander, M., & Zhao, J. (2002). Overcoming barriers to successful delivery of distance-learning courses. *Journal of Education for Business, 77*(6), 313-318.

Piaget, J. (1936). *Origins of intelligence in the child.* London: Routledge & Kegan Paul.

Ping Lim, C., Zhao, Y., Tondeur, J., Ching Sing, C., & Ching-Chung, T. (2013). Bridging the gap: Technology trends and use of technology in schools. *Journal of Educational Technology & Society, 16*(2), 59-68.

Pollard, H., Minor, M., & Swanson, A. (2014). Instructor social presence within the community of inquiry framework and its impact on classroom community and the learning environment. *Online Journal of Distance Learning Administration, 17*(2).

Putney, L. G., & Wink, J. (2014). Qualitative Program Evaluation Research Methods: Employing the Complementary Analysis Research Matrix Application (CARMA). *EQRC.* Las Vegas, NV.

Quality Matters. (2014). Retrieved from Quality Matters Rubric: https://www.qualitymatters.org

Ralston-Berg, P. (2014). Surveying student perspectives of quality: Value of QM Rubric items. *Internet Learning, 3*(1), 116-125.

Ralston-Berg, P., & Nath, L. (2011). *What makes a quality online course? The student perspective.* Paper presented at the 3rd Annual Quality Matters Conference. Baltimore, MD.

Reeves, T. C. (2006). How do you know they are learning?: The importance of alignment in higher education. *International Journal of Learning Technology, 2*(4).

Rienties, B., Brouwer, N., & Lygo-Baker, S. (2013). The effects of online professional development on higher education teachers' beliefs and intentions towards learning facilitation and technology. *Teaching and Teacher Education, 29*, 122-131.

Rogers, E. (1995). *Diffusion of Innovations.* New York: The Free Press.

Roulston, K., Pope, E. P., & deMarrais, K. (2018). Students' perceptions of learning about qualitative inquiry in online contexts. *American Journal of Distance Education, 32*(3), 190-201.

Rovai, A. P. (2007). Facilitating online discussions effectively. *The Internet and Higher Education, 10*(1), 77-88.

Sancho-Vinuesa, T., Escudero-Viladoms, & Masia, R. (2013). Continuous activity with immediate feedback: A good strategy to guarantee student engagement with the course. *Open Learning, 28*(1), 51-60.

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological pedagogical content knowledge (TPACK) the development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education, 42*(2), 123-149.

Schrum, L. (1999). Technology professional development for teachers. *Educational Technology Research and Development, 47*(4), 83-90.

Shaaban, K. (2006). An initial study of the effects of cooperative learning on reading comprehension, vacabulary acquisition, and motivation to read. *Reading Psychology, 27*(5), 377-403.

Shattuck, K. (2007). Quality matters: Collaborative program planning at a state level. *Online Journal of Distance Learning Administration, 10*(3).

Shattuck, K. (2012). *What we're learning from Quality Matters-focused research: Research, practice, continuous improvement.* Retrieved from Quality Matters: https://www.qualitymatters.org/what-were-learning-paperfinalmay-18-2012dec2012kspdf/download/What%20we're%20learning%20paper_FINAL_May%2018,%202012_Dec2012ks pdf

Shattuck, K., Zimmerman, W. A., & Adair, D. (2014). Continuous Improvement of the QM Rubric and Review Processes: Scholarship of Integration and Application. *Internet Learning Journal, 3*(1).

Sheridan, K., & Kelly, M. A. (2010). The indicators of instructor presence that are important to students in online courses. *MERLOT Journal of Online Learning and Teaching, 6*(4).

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1-22.

Spector, J. M. (2013). Emerging educational technologies and research directions. *Educational Technology & Society, 16*(2), 21-30.

Spotts, T. H., & Bowman, M. A. (1993). Increasing faculty use of instructional technology: Barriers and incentives. *Educational Media International, 30*(4), 199-204.

Swan, K. (2001). Virtual interactivity: design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education, 22*(2), 306-331.

Sweller, J. (1999). *Instructional Design in Technical Areas.* Melbourne, Australia: ACER Press.

Tabata, L. N., & Johnsrud, L. K. (2008). The impact of faculty attitudes toward technology, distance education, and innovation. *Research in Higher Education, 49*(7), 625-646.

Taylor, E. W. (2008). Transformative learning theory. *New Directions for Adult and Continuing Education, 2008*(119), 5-15.

Tømte, C., Enochsson, A. B., Buskqvist, U., & Kårstein, A. (2015). Educating online student teachers to master professional digital competence: The TPACK-framework goes online. *Computers & Education, 84*, 26-35.

Tyler-Smith, K. (2006). Early attrition among first time eLearners: A review of factors that contribute to drop-out, withdrawal, and non-completion rates of adult learners undertaking eLearning programmes. *Journal of Online Learning and Teaching, 2*(2), 73-85.

Van Merrienboer, J. J., Kirschner, P., & Kester, L. (2003). Taking the load off a learner's mind: Instructional design for complex learning. *Educational Psychologist, 38*, 5-13.

Vangrieken, K., Meredith, C., Packer, T., & Kyndt, E. (2017). Teacher communities as a context for professional development: A systematic review. *Teaching and Teacher Education*, 47-59.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Ward, C. (2012). *The development of technological pedagogical content knowledge (TPACK) in instructors using Quality Matters training, rubric, and peer collaboration.* Presented at the 3rd annual Quality Matters Conference. Baltimore, MD.

Wichadee, S. (2018). Significant predictors for effectiveness of blended learning in a language course. *JAL CALL Journal, 14*(1), 25-42.

Wittrock, M. C. (1974). Learning as a generative process. *Educational Psychologist, 11*(2), 87-95.

Wittrock, M. C. (1992). Generative learning processes of the brain. *Educational Psychologist, 27*(4), 531-541.

Wood, D. J., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychiatry and Psychology, 17*(2), 89-100.

Yilmazel-Sahin, Y., & Oxford, R. L. (2010). A comparative analysis of teacher education faculty development models for technology integration. *Journal of Technology and Teacher Education, 18*(4), 693-720.

Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: Sage Inc.

Yorke, M. (2004). Retention, persistence and success in on-campus higher education and their enhancement in open and distance learning. *Open Learning, 19*(1), 19-32.

Zelin, R. C., & Baird, J. E. (2011). Training faculty to use technology in the classroom. *College Teaching Methods & Styles Journal (CTMS), 3*(3), 41-48.

Curriculum Vitae

YVETTE M. AQUI
E-mail: yvette.aqui@gmail.com

Education

Ph.D.	Learning and Technology, December 2018 University of Nevada, Las Vegas Dissertation title: The effect of instructors training on technology adoption, course design, and student experiences: A multiple case study of training based on TPACK or Quality Matters
M.S.	Educational Psychology, May 2002 University of Nevada Las Vegas Professional paper title: The development of a multidisciplinary website: Creation, evaluation, and maintenance.
B.S.	Psychology, May 1997 University of Hawaii at Manoa, Honolulu, Hawaii

Professional Experience

May 2004 to present — **WebCampus (LMS) Administrator**, University of Nevada, Las Vegas
Client Services - Office of Information Technology
Responsibilities include providing tier 2 technical support for faculty and students utilizing the learning management system (LMS) – WebCT, Blackboard, and Canvas, monitor the integration between the LMS and PeopleSoft, review and develop knowledge base articles and tutorials, and review support tickets for quality assurance purposes. Also involved with the planning, communication, and testing processes related to any upgrades or changes to the LMS. Occasionally conduct presentations regarding technology and the LMS to faculty, student cohorts, and other support staff.

June 2004 to May 2014 — **Part-time Online Instructor**, University of Nevada, Las Vegas
Department of Educational Psychology

- Teach (using Blackboard Vista) distance education courses in educational psychology
- Courses:
    - EPY 303 - Introduction to Educational Psychology
    - EPY 702 – Research Methods

May 2002 to May 2004	**Assistant Instructional Designer**, University of Nevada, Las Vegas Distance Education Department Responsibilities included providing instructional design assistance to faculty teaching distance education courses, conducting individualized WebCT CE 4.1 support and training, updating links and materials in courses, developed an online course evaluation for distance education courses, and created WebCT tutorials for faculty.
2001 to 2002	**Graduate Assistant**, University of Nevada Las Vegas Department of Educational Psychology Responsibilities included assisting faculty with course instruction and research. Other duties included creating and designing faculty web pages (personal and for use in online courses).

Other Teaching Experience

Fall 2003 to Spring 2004	**Teaching Assistant**, University of Nevada Las Vegas Department of Educational Psychology (Under the supervision of Dr. Michael Nussbaum) EPY 303: Educational Psychology – Distance Education Course EPY 451: Foundations of Educational Assessment – Distance Education Course Responsibilities included grading assignments and/or exams; facilitation of online discussions; communicated with students in the course regarding grades, assignments, and technical issues; created assessment questions; and updated course documents prior to the start of the semester.
May 2004 to present	**Technical Workshop Facilitator** Conducted workshops/tutorials on the following applications: WebCT/Blackboard Learn Canvas RoboDemo (now known as Adobe Captivate) SEND (Student E-Newsletter by Department) e-mail program

Research and Publications

Articles (in refereed journals)

Reid, K. M., Aqui, Y., & Putney, L. G. (2009). Evaluation of an evolving virtual high school. *Educational Media International, 46* (4), 281-294.

Nussbaum, E. M., Winsor, D. L., Aqui, Y. M. & Poliquin, A. M. (2007) Putting the pieces together: Online argumentation vee diagrams enhance thinking during discussions. *International Journal of Computer-Supported Collaborative Learning, 2 (4)*, pp. 479-500.

Hong, E., & Aqui, Y. (2004). Cognitive and motivational characteristics of adolescents gifted in mathematics. *Gifted Child Quarterly, 48,* 191-201.

Presentations

Aqui, Y. (2005, June). *Characteristics of the online learner: Experiences, participation level, and achievement.* Paper discussion presented at the National Educational Computing Conference, Philadelphia, PA.

Hartley, K., Nussbaum, E. M., & Aqui, Y. (2005, April). *Personality variables and on-line discussions.* Paper discussion presented at the annual meeting of the American Educational Research Association, Montreal, Canada.

Grants

- $500 Graduate and Professional Student Association Travel Grant, University of Nevada, Las Vegas (2005)
- $500 Special Interest Group – Teacher Education Graduate Student Travel Stipend, International Society for Technology in Education (2005)

Professional Affiliations & Committees

- Member, Course Management System Implementation Committee, UNLV
- Member, Course Template Committee, UNLV
- Chair, LMS Training & Support Specialist Search Committee (2015)
- Member, Web Design and Development Specialist Search Committee (2015)

Certifications and Awards

- ITIL Foundations Certification, 2017
- Executive Impact Communications Customer Service, and Presentations, 2015
- Training the Trainer (American Management Association), 2015
- Blackboard Learn Teaching and Learning Online Certification, 2013
- Blackboard Learn Course Delivery GUI Administration, 2012
- WebCT Vista Certified Administrator, 2005
- WebCT Campus Edition Senior Level Certified Trainer, 2004
- Service Award (2010) – University of Nevada Las Vegas, Office of Information Technology