QUALITY TECHNOLOGY INTEGRATION IN THE COLLEGE CLASSROOM:

A GUIDE FOR FACULTY

by

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ABSTRACT

This dissertation is the result of active research that provides a faculty guide for immediate application. The guide is a collection of technology integration ideas for faculty. Benefits include a self-identification tool for faculty of his/her technology knowledge level, which is matched with a technology integration model. Each model has relevant application through best practices of technology integration in the guide.

The active research is in response to the exponential growth of the impact that technology has had on society, requiring institutions of higher education to continually reexamine curriculum design and implementation. While students both expect the use of technology in the classroom and need to have technology knowledge for employment, the integration of technology in the classroom remains a critical issue for faculty

The researcher works at one of nine physical campuses (not including extension sites and an online campus) of an independent, not-for-profit college system in the Midwest. The researcher’s campus employs, on average, 200 faculty per academic term. Due to the nature of experts needed for various programs at the researcher’s college, not all faculty members have teacher training or teaching experience. The researcher wrote the guide as a supplement to professional development opportunities. Best practices included in the guide focus on student engagement via group work, formative and summative assessment, and using Learning Management Systems.

DEDICATION

This dissertation is dedicated to the Baker College of Muskegon faculty, who unknowingly inspire me every day, who continually fuel my desire to encourage collaboration across all departments of the college, and who are so much smarter than they think they are.

ACKNOWLEDGMENTS

To my dissertation chair, Dr. Stephen Snyder: Thank you for seeing potential in me that I did not recognize until you told me that I could do what you do. Through your mentoring, I have become an academic leader who remains true to self, embraces the culture of leadership, and forms a bridge between groups on campus that don't always see eye-to-eye. You are a true leader, with integrity and character that no one can dispute. You're the best boss I've ever had. I would not be where I am today without you. This is <u>all your</u> fault!

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To the current and past academic leadership team, faculty, staff, and students at Baker College of Muskegon: I believe in the mission of our college, and I get up every day knowing that my work with you has meaning and value. We do important work and make great contributions to our community. Thank you for allowing me to be a part of it.

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To my Group: We did it — individually and together — through the support for each other. What an amazing accomplishment and what an even more amazing lifelong friendship.

To my family: Despite the days where I neglected paying attention to you, didn't tend to household matters, and talked incessantly about doctoral coursework that you probably didn't care about, you all supported and encouraged me all the way through. You never stopped believing that I could do this. I have the best children and husband in the world. Everything I do is because of you, the DeanCrew. I love you!

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CHAPTER ONE: INTRODUCTION

THE IMPACT

The exponential growth of the impact that technology has had on society just in the past decade alone requires institutions of higher education to continually reexamine curriculum design and implementation. In fact, a survey released in 2000 by Campus Computing Project revealed that "helping faculty members integrate technology with instruction continues to be the main priority of academic-computing administrators" (Carlson, 2000, para. 1). Just ten years later, the 2010 Campus Computing Project survey revealed that 98% of students own cell phones and that students expect institutions to provide similar instructional resources, such as mobile apps (Green, 2010). In this same survey, results indicated a significant shift towards Learning Management Systems (LMSs), although deployment was low (Green, 2010); this seems to indicate that LMSs began to be commonplace by 2010, but utilized little.

Data-driven skills and digital awareness in higher education graduates have become increasingly critical in the past decade (Selingo, 2016). Brian Fitzgerald, head of the Business-Higher Education Forum, states that "even non-tech jobs are tech jobs" (Selingo, 2016, p.50). While students both expect the use of technology in the classroom and need to have technology knowledge for employment, the integration of technology in the classroom remains a critical issue for faculty.

Problems arise when educational institutions spend exorbitant amounts of money on technology software and hardware, only to find that few educators are using the technology effectively or at all. One school consultant stated that there is nothing transformative about having technology in the classroom unless you are able to utilize higher order teaching and learning (Herold, 2015). From the research, Herold (2015) gives several reasons why technology has not significantly changed the way teachers teach, including teachers' beliefs about what constitutes effective instruction, their lack of technology expertise, and erratic training.

From the student perspective, technology has become a norm. As older students not as familiar with technology exit the higher education arena, a higher number of younger students will replace older students. These younger students are considered to be digital natives and have had more exposure to technology, particularly students identified as Generation Z (students born as early as 1990 and as late as 2000). A report from Barnes & Noble College (2015) describes these young students and their approach to learning with technology:

> Gen Z wants engaging, interactive learning experiences. They want to be challenged, they want to be empowered to make their own decisions, and as digital natives, they expect technology to play an instrumental role in their educational experience. While traditional textbooks still reign supreme, there's no denying that the future of educational technology, or "ed tech," is now. (p. 8)

If younger students expect engaging and interactive learning experiences, faculty must be able to adapt lessons and infuse learning experiences with technology that are relevant and that match the learning expectations. Faculty must be prepared to adjust to the growing reality of a technologically connected global society.

DEFINING TECHNOLOGY

Technology is a constantly changing field, and thus defining technology changes with perspective and time. For the purposes of this dissertation, technology encompasses seven categories with selected technologies, tools, and strategies created by the New Media Consortium in a 2015 report (see Figure 1). These categories "are intended to provide a way to illustrate and organize emerging technologies into pathways of development that are or may be relevant to learning and creative inquiry" (Johnson, Adams Becker, Estrada, and Freeman, 2015). Therefore, integrating technology in the classroom could refer to a singular category, technology, tools, or strategy, or any combination of the latter.

Consumer Technologies
> 3D Video
> Drones
> Electronic Publishing
> Mobile Apps
> Quantified Self
> Tablet Computing
> Telepresence
> Wearable Technology

Digital Strategies
> Bring Your Own Device (BYOD)
> Flipped Classroom
> Games and Gamification
> Location Intelligence
> Makerspaces
> Preservation/Conservation Technologies

Internet Technologies
> Cloud Computing
> The Internet of Things
> Real-Time Translation
> Semantic Applications
> Single Sign-On
> Syndication Tools

Learning Technologies
> Badges/Microcredit
> Learning Analytics
> Massive Open Online Courses
> Mobile Learning
> Online Learning
> Open Content
> Open Licensing
> Virtual and Remote Laboratories

Social Media Technologies
> Collaborative Environments
> Collective Intelligence
> Crowdfunding
> Crowdsourcing
> Digital Identity
> Social Networks
> Tacit Intelligence

Visualization Technologies
> 3D Printing/Rapid Prototyping
> Augmented Reality
> Information Visualization
> Visual Data Analysis
> Volumetric and Holographic Displays

Enabling Technologies
> Affective Computing
> Cellular Networks
> Electrovibration
> Flexible Displays
> Geolocation
> Location-Based Services
> Machine Learning
> Mesh Networks
> Mobile Broadband
> Natural User Interfaces
> Near Field Communication
> Next-Generation Batteries
> Open Hardware
> Speech-to-Speech Translation
> Statistical Machine Translation
> Virtual Assistants
> Wireless Power

Source: Johnson, Adams Becker, Estrada, and Freeman, 2015).

Figure 1. Seven categories of technologies, tools, and strategies for the purposes of defining technology

UNDERSTANDING THE INSTITUTIONAL CONTEXT AND THE RESEARCHER'S BACKGROUND

The researcher works at one of nine physical campuses (not including extension sites and an online campus) of an independent, not-for-profit college system in the Midwest. The researcher's campus employs, on average, 200 faculty per academic term. Due to the nature of experts needed for various programs at the researcher's college, not all faculty members have teacher training or teaching experience. Often, faculty are hired based on credentials in the field rather than teaching experience. For this reason, it is common that faculty at the researcher's (and similar institutions) college have little to no experience planning for and implementing technology in the classroom, and little to no experience with various teaching methods.

While the researcher's college campuses do not have physical Center for Teaching and Learning structures (or similar), the system itself has a department that fully supports faculty and staff in effective teaching and learning. Additionally, each campus location (including the online campus) employs at least one full time classroom support point of contact. One of the main roles of the point of contact is to support faculty and program officials in instructional effectiveness through professional development. The researcher is employed in the point of contact role.

Because of the researcher's point of contact role, several years of increasing responsibility of professional development and increasing work with faculty added to the researcher's knowledge and experience. Additionally, the researcher has over 20 years of experience in education at multiple levels and roles. The researcher's main focus in the product is faculty, specifically adjunct faculty, who may or may not have teacher training in his/her background.

The researcher spent most of the two years preceding the development of the product working with faculty in professional development, with a specific focus on working with faculty with technology integration and using the college's learning management system (LMS). Throughout both years, the researcher consulted informally with colleagues within and outside the researcher's college system on faculty mindset, technology integration approaches, and effective communication among various college departments but centering on faculty.

It is important to understand that the researcher approached the product with the idea that the user of the guide would be employed at a college where support for faculty exists in the college, but not necessarily in a designated space. This means that faculty support exists in structure or design, meaning a point of contact for support and a system of support, but not space or location, such as a Center for Teaching and Learning (or similar). The researcher's college system fully support faculty, but does not have a physical designated space on every campus that is solely dedicated to faculty for professional development that is common at public universities or large college campuses. Because of this distinction, the guide serves as a supplement to other professional development offerings on campuses similar to the researcher's, and serves as a self-learning tool for faculty who are seeking a quick reference or succinct overview of suggested or required technology integration efforts on his/her college campus. It is not the researcher's intention to use the guide as a replacement for ongoing professional development opportunities on the campus.

THE PROBLEM

The focus of most faculty professional development in higher education traditionally tends to be on the results of classroom impact on students. Little attention has been paid to the process of developing faculty as better learners so that they can become better teachers. It seems counterproductive to expect faculty to utilize transformative teaching and learner-centered instruction if they themselves have never experienced transformative learning. For this reason, the researcher suggests that the guide offers faculty a chance to shift the learning process, over time, from teacher-directed to learner centered, as illustrated in Figure 2.

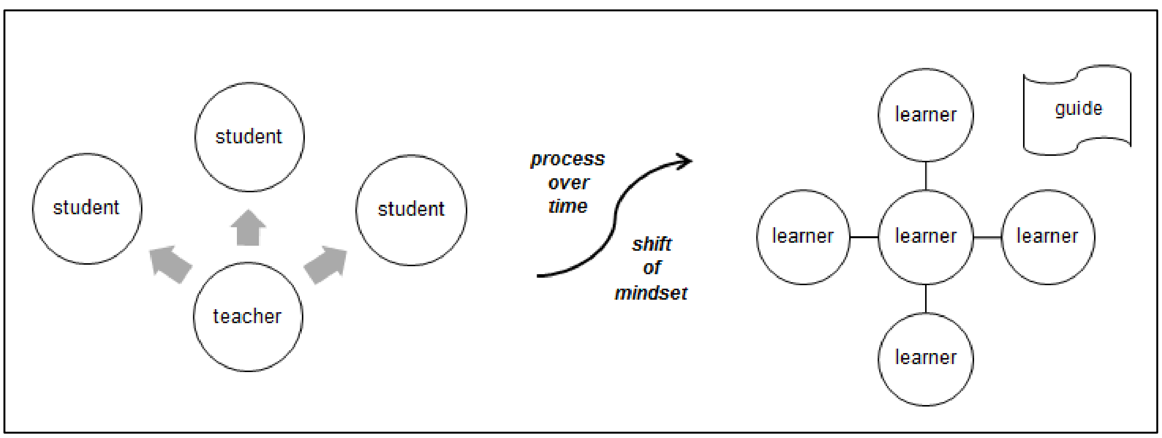


Figure 2. Shifting the learning process from teacher-directed to learner-centered.

Instead of designing professional development that centers around one type of technology, where the presenter demonstrates the technology and the faculty observe, faculty should be discovering technology on their own. Faculty should have a chance to experiment with various technology implementations and determine what works best with the subject matter content and the intended learning outcomes. From there, faculty should share this with other faculty members, allowing administration (i.e. those in charge of technology and classroom teaching or evaluation) to be the guides and the faculty to be the learners.

Essentially, faculty need to be able to seamlessly integrate technology as one of many teaching strategies. For some faculty, this will simply be an improvement on current lessons; for others, this will be a difficult journey as they examine their own doubts and fears about technology use and perhaps even weaknesses in teaching strategies. It is important to consider the professional development support for faculty not just with integrating technology in the classroom, but also improving classroom teaching. By helping shift faculty mindset, as described in Chapter Two, faculty are more likely to be able to successfully integrate technology in the classroom.

THE PROCESS

Although this dissertation is not traditional, meaning traditional research was not completed, the process for determining end goals for the product, or guide, began with some fundamental questions and assumptions.

This process began with three questions, each of which has a brief answer that is explored in the literature review. These answers are based on the researcher's perspective, and are represented visually with the researcher's thought process that generated parts of the answers to questions (see Figure 3).

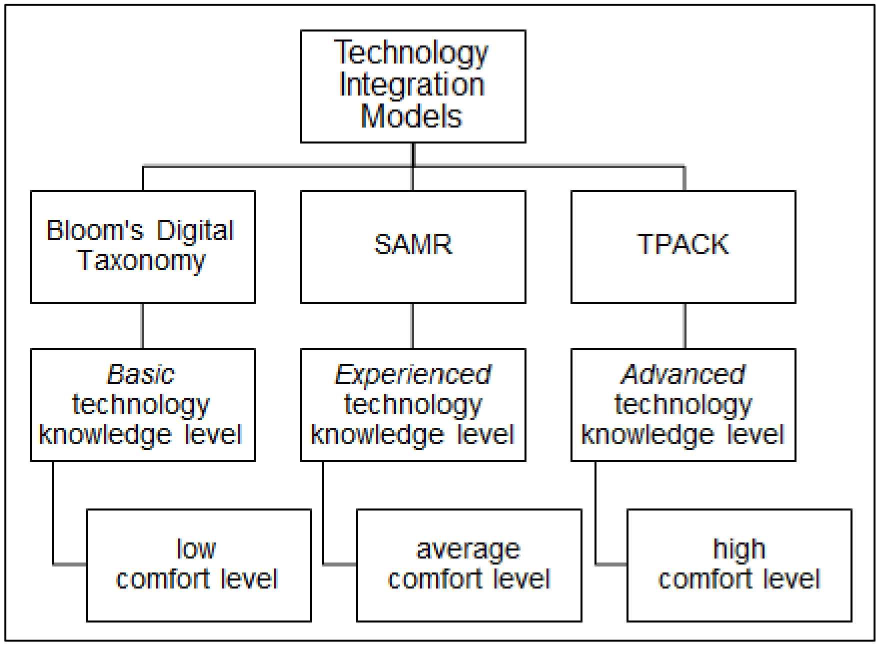


Figure 3. Visual model of the researcher's questions and assumptions.

Question 1

What technology integration models exist that can help guide faculty through the technology integration process? The researcher was aware that some models existed. During the process, three distinct models were explored: Bloom's Digital Taxonomy, the SAMR Model, and the TPACK Model. Originally, the researcher thought choosing one model would suffice. Upon further exploration, it became apparent that a "one size fits all" model did not make sense. There are so many varying levels of faculty technology knowledge and comfort levels. Each model seemed more or less complex than the others, and each model approached technology integration in a different way. Bloom's Digital Taxonomy seemed to match with all knowledge levels, and would therefore be the most appropriate for faculty at a low level of technology knowledge and comfort. The SAMR Model appears simple but requires a stronger understanding of the connections between learning outcomes and technology use, and would therefore be the most appropriate for faculty with an average level of technology knowledge and comfort. The TPACK Model is complex, requiring a complete understanding of subject matter, pedagogical methods, and technology. For this reason, the TPACK Model would be the most appropriate for faculty at a high level of technology knowledge and comfort.

Question 2

Is there a way for faculty to self-identify as having a basic, experienced, or advanced technology knowledge level? The researcher created a self-identification tool for faculty. The individual faculty reads six progressively increasing statements regarding overall technology experience as a faculty member, and chooses the statement that best describes him/her. The first two statements are matched with a Basic Technology Knowledge Level and a low comfort level. The third and fourth statements are matched with an Experienced Technology Knowledge Level and an average comfort level. The final two statements are matched with an Advanced Technology Knowledge Level and a high comfort level. As described previously, each of the knowledge and comfort levels was matched with a technology integration model.

Question 3

Are there best practices that can be identified to help faculty make quality technology integration decisions? Through the literature review and other experiences, the researcher determined that a guide for faculty would be the best way to communicate best practices.

ASSUMPTIONS

The researcher assumes three critical concepts regarding the faculty connection to quality technology integration in the college classroom. These concepts are not hierarchical, but must be included to ensure quality technology integration in the classroom. The three critical concepts are learning outcomes, technology knowledge level, and professional development opportunities. Figure 4 illustrates these concepts as a continuous cycle.

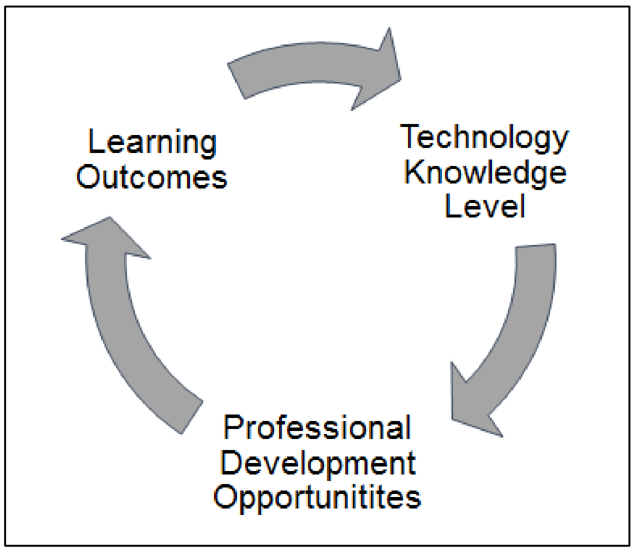


Figure 4. Three critical components regarding the faculty connection to quality technology integration in the college classroom.

First, some faculty need assistance connecting learning outcomes with appropriate use of technology. While meeting learning outcomes might be easily done without technology, it is the integration of technology to meet learning outcomes that faculty may need assistance. For example, a learning outcome is met by students writing a research paper. Faculty may need assistance determining a way to integrate technology appropriately, such as adding a presentation piece or sharing a section of the research paper on a discussion board for classmates to analyze. Connecting learning outcomes with appropriate use of technology might involve a one-on-one conversation, a mentoring process between faculty and peers or faculty and the campus point of contact for classroom support, or professional development opportunities. At some point, faculty should be able to connect learning outcomes with appropriate use of technology on their own.

Second, faculty who self-identify as having only a basic level of technology knowledge will need more assistance with understanding, choosing, and utilizing technology and connecting learning outcomes than faculty who self-identify as having an experienced level or an advanced level of technology knowledge. As faculty become more comfortable or more familiar with using technology, and in turn move to a higher technology knowledge level, less assistance will be needed.

Finally, faculty need professional development opportunities that help them find lasting value in technology integration. Professional development opportunities are broadly defined as opportunities that are offered by the institution either formally or informally. Examples include planned training sessions or workshops (compulsory or self-selected), informal small group discussions, one-on-one consultations with the campus point of contact for classroom support, and independently selected professional development that is self-directed.

SUMMARY

In this Chapter, a brief introduction was given. This product dissertation, in the form of a guide, focuses on quality technology integration in the college classroom. The guide gives some foundational support for why integrating technology in the classroom is necessary, explains what to consider when planning integration of technology, and provides tips to guide faculty with general and specific technology integration ideas. The organization of the remainder of this product dissertation is in four chapters. Chapter Two will review student learning and engagement with technology, as well as faculty and technology expectations, and explore theoretical frameworks of technology integration. Chapter Three will go through the process of creating the guide. Chapter Four is the guide itself, or the product that can stand alone. Chapter Five will discuss implications and offer suggestions for further development.

CHAPTER TWO: LITERATURE REVIEW

INTRODUCTION

Critical to the development of this product dissertation was determining a foundational point of reference. Since the purpose of the guide is to provide a collection of technology integration ideas for faculty, it is necessary to provide a foundational point of reference for faculty to understand not only what to do, but why. For faculty, that foundational point of reference is an integration model that most closely matches with a faculty member's technology knowledge level. Determining which model to use became clear after reviewing the literature on student learning and engagement with technology, as well as faculty and technology expectations.

STUDENT LEARNING AND ENGAGEMENT WITH TECHNOLOGY

Of significant interest to the researcher is the work of Terry Doyle, an author, educational consultant, and former professor, known for Learner-Centered Teaching. Doyle encourages faculty to become learner-centered teachers "regardless of their discipline" (Bishop, Casting, and King, 2014, p. 46). There are several terms used for essentially the same teaching and learning concept that puts students in the center of the learning process: Learner-Centered Teaching, Student-Centered Learning, and Learner-Centered Instruction.

Learner Centered Instruction (LCI) is an active process, optimizing opportunities for students to learn by determining the best ways to get students to learn by doing (Doyle, 2011). Doyle bases this on neuroscience studies, and states that “the only way for our students to increase their learning is to actively engage in learning the content and skills we teach” (Doyle, 2011, p. 8). Doyle emphasizes the shift in approach from traditional teaching methods: “This means that most of the time, our students need to be doing more than just listening to a lecture. Our students need to be doing the work” (Doyle, 2011, p. 8). However, he clarifies the use of lecture:

> Lecture has an important place in a learner-centered practice. Students will always need teachers to explain complex and complicated information and to give great examples to help connect new information to students’ backgrounds. This remains a vital role for faculty members. However, the use of lecture in a learner-centered practice needs to follow a simple definition; lecture is talking to students about things they can’t learn on their own. When seeking to optimize students’ learning, teachers must make careful decisions in determining when students need to listen and when they need to try to figure things out on their own. (Doyle, 2011, pp. 8-9)

With multiple technology platforms now easily and readily available to students and faculty, integrating technology in the learning experience supports Doyle’s insistence on guiding students to learn some things on their own.

The emphasis on increasing student engagement and integrating technology can create resistance among faculty, seeing these strategies as additional work to the existing teaching load. Yet Redovich, in a 2008 report from the Center for the Study of Jobs & Education in Wisconsin and the United States, claims that:

> Technology makes jobs simpler, not more difficult, and makes workers more productive. The great majority of the jobs of the future are the same jobs of the

> twentieth century with new technological tools that make these jobs easier to do. (as cited in Cody, 2008, para. 6)

Convincing all faculty that integrating technology is important and necessary is not as easy.

Engaging students in the learning process by adding technology is supported by the U. S. Department of Education, claiming that technology increases student engagement and motivation and accelerates learning (U. S. Department of Education, n.d.). One college student stated that having technology in the classroom changes the atmosphere and is a more engaging way to learn (Bartell, 2015). And while technology may be viewed as by faculty as distracting, students "are also using it to take a more active role in learning, and it can create a more entertaining and interactive environment in the classroom" (Barnes & Noble College, 2014).

The problem may not be just convincing all faculty that technology integration increases student engagement. For many, the technology knowledge of the students is above and beyond the technology knowledge of faculty. Students who engage with technology outside of the classroom may be more comfortable with technology than faculty (Joy, Foss, King, Sinclair, Sitthiworachart, and Davis, 2014). Additionally, students who are completely comfortable with using technology have high expectations for faculty members' technology knowledge and skill, according to a project conducted by an Educause intern (Roberts, 2005).

FACULTY AND TECHNOLOGY EXPECTATIONS

There is a plethora of literature available that both supports and dismisses technology use in the classroom, online learning, expectations of faculty, and faculty development. Critical to the development of this product are the recommendations to support and develop faculty, as well as attempting to meet the diverse needs of faculty, in regards to technology knowledge and integration in the classroom.

According to Briggs, faculty development “remains one of the biggest impediments to the wider use of technology in education” (Briggs, 2013, para. 1). The nature of mainly part-time faculty at most higher education institutions contributes to this impediment. Some faculty do not have time to attend scheduled trainings or workshops; others simply will not attend unless a monetary compensation is attached. One recommendation for this problem is not to wait for faculty to attend, but instead to go to where the faculty are. Walking the halls of the college and seeking out faculty presence increases the opportunity to communicate with faculty. Asking faculty directly what technology needs they have has proven to be an effective solution (Briggs, 2013).

Faculty need timely and effective support (Joy et al., 2014) with hands on use in a class setting to help foster positive experiences and attitudes about using technology (Brill and Galloway, 2007). Developing proficiency in choosing appropriate technology to meet learning outcomes seems to be best met by offering workshops or events that showcase how technology integration aids in classroom processes (Brill and Galloway, 2007).

FACULTY MINDSET

Integrating technology in the classroom can be uncomfortable to some and exciting to others. By shifting the mindset of faculty, or the established set of attitudes about technology held by faculty, gains can be made in both faculty development and student learning. Dweck (2000) categorized these attitudes as either fixed mindset or growth mindset. In a fixed mindset, basic abilities, intelligence, and talents are limited to a certain amount; in a growth mindset, talents and abilities can be developed through effort and persistence (Dweck, 2000).

Using mindset as the way faculty approach integrating technology speaks to both the technology knowledge levels and the comfort levels described in the product and used in creating the tool to help faculty determine his/her technology knowledge level. Blair (2012) insists that new 21st century learners, meaning learners in the second decade of the 21st century, “are capable of engaging in learning at a whole new level” and “need teachers and administrators to re-envision the role of technology in the classroom” (para. 3). Blair goes on to describe the shift of mindset necessary:

> In the former mindset of teaching with technology, the teacher was the focal point of the classroom, creating (often time-consuming) interactive and multimedia presentations to add shock and awe to his or her lessons and capture the attention of the 21st century child. A new mindset of teaching through technology must emerge, which depends on a vital shift in teacher/student roles. (Blair, 2012, p. 10)

Faculty need to recognize his/her technology mindset first, and be willing to develop through effort and persistence. It is this shift in mindset that will help faculty successfully integrate technology in the classroom (Blair, 2012).

MODELS

Three integration models were explored during the process of designing the product. At one point, picking a singular model was thought to be ideal. However, experience and observation suggest that each model has characteristics that are better suited for some groups of faculty than for others. The models have been put in an order of complexity and application, meaning that each model becomes increasingly more complex than the previous in both theory and use, although faculty may choose to use a model other than the one suggested for his/her technology knowledge level. The integration models are Bloom's Digital Taxonomy, the SAMR model, and the TPACK model.

Bloom's Digital Taxonomy

Bloom's Taxonomy is a commonly used model in all levels of education. Developed by Benjamin Bloom in 1956, the taxonomy categorizes cognitive objectives and follows the thinking process. Each category builds upon the previous, from lower order thinking skills to higher order thinking skills (Churches, 2008).

The original taxonomy contained six levels: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. It was later modified by a group of psychologists and educational researchers, and retitled as Bloom's Revised Taxonomy in 2001 with one significant difference; the levels, originally labeled using nouns, were relabeled using verbs. In the revised taxonomy, the six labels are Remember, Understand, Apply, Analyze, Evaluate, and Create (Krathwohl, 2002).

Bloom's taxonomy	Bloom's modified taxonomy	Bloom's extended digital taxonomy	Thinking Skills
		Sharing	Higher Order
Evaluation	Creating	Creating	
Synthesis	Evaluating	Evaluating	
Analysis	Analyzing	Conceptualizing	
Application	Applying	Applying	
Comprehension	Understanding	Connecting	
Knowledge	Remembering	Doing	Lower Order

Adapted from Fractus Learning (2014).

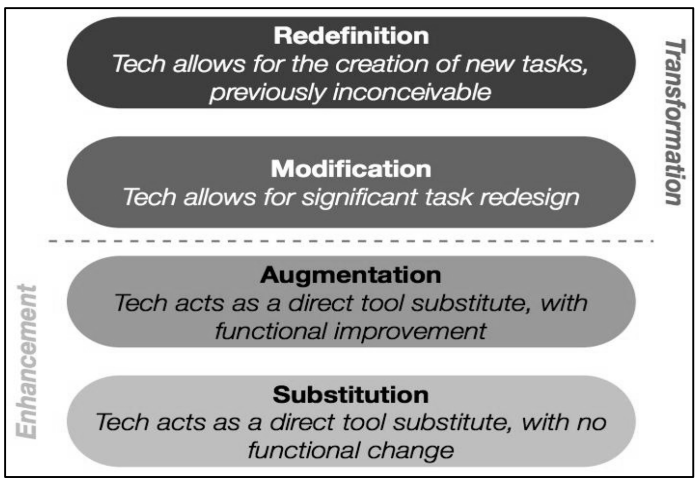
Figure 5. Bloom's Digital Taxonomy.

The taxonomy was expanded further in 2007 by Andrew Churches to reflect 21st century teaching and learning (Roberts, 2011). Churches added verbs to each level that specifically refer to technology actions, such as searching to coincide with Remembering and posting to match with Evaluating. Some visual aids show the digital taxonomy levels labeled as Doing, Connecting, Applying, Conceptualizing, Evaluating, and Creating, with an additional level added for digital taxonomy at the highest end labeled Sharing.

Bloom's Digital Taxonomy is simple to understand. Verbs describe the action of the learner and can easily be matched with learning outcomes of lessons or courses. Newer faculty with no formal teacher training can use the Bloom's Digital Taxonomy visual aid to determine if the intention of the technology chosen appropriately meets the desired learning outcome. Based on the simplicity and ease of use, this model matches with faculty who have very basic technology knowledge.

SAMR

SAMR is an acronym for Substitution, Augmentation, Modification, and Redefinition. The SAMR model was created by Ruben Puentedura for educators and librarians with the purpose of examining levels of technology usage with students (Jacob-Israel and Moorefield-Lang, 2013). These levels are not as clear or commonplace as Bloom’s Taxonomy because they are not generalized for education but rather specific to technology usage. Each level represents how technology is used by students to not just complete an educational task, but to enhance or transform it.



Source: Retrieved from: hippasus.com/resources/sweden2010/SAMR_TPCK_IntroToAdvancedPractice.pdf
Figure 6. SAMR Model.

At the Substitution level, technology is used to directly substitute another tool. For example, an e-book might be used in place of a traditional print book. In the e-book, features allow students to highlight, bookmark, and make notes. This is a utilization of technology that enhances the task, but the end result is essentially the same (Puentedura, 2014).

The Augmentation level also utilizes technology to enhance a task, yet a functional improvement exists (Puentedura, 2014). For example, an online map can be labeled, and the labels can be hyperlinked to audio, video, documents, or websites that give detail and more in depth explanations of the geographical area (Walsh, 2015).

At the Modification level, technology significantly redesigns, or transforms, the task (Puentedura, 2014). This is seen often in flipped classrooms, where videos and lessons are completed outside of class so that class time can be used for practice or reinforcement. For example, instead of watching a video in class and then practicing or discussing the topic, students would watch the video ahead of time and go directly to the practice or discussion in class (Walsh, 2015).

Finally, the Redefinition level completely transforms the task by creating new tasks that would not be possible without technology. For example, instead of writing a report on the Industrial Revolution, students can use a movie application, such as Apple’s iMovie, that allows them to add audio, video, and images. This movie can be published and shared, completely transforming the original task of simply writing a report (Puentedura, 2014).

The SAMR model was developed in 2006. Most of the literature goes directly to the use of the model without analyzing the model itself. This is most likely due to the intention of the model to “encourage educators to significantly enhance the quality of education provided via technology" (Rommel, Kidder, and Wood, 2014, p. 4). This suggests that an effective use of the SAMR model is to classify and evaluate technology activities to understand how technology transforms learning, as well as guiding educators and instructional designers when creating learning experiences for students (Rommel, Kidder, and Wood, 2014). The SAMR model is often used in combination with or supplemental to other models, including Bloom's Digital Taxonomy and the TPACK model (Brouwer, Dekker, and van der Pol, 2013; Hunter, 2015; Oakley and Pegrum, 2014).

The SAMR model has only four levels and appears to be quite simple, but faculty could confuse enhancement and transformation. There also needs to be a level of experience with technology, from faculty and students. It would not be wise for a faculty member with very little technology knowledge to be expected to have students create and publish a movie in place of writing a paper. The technology itself should not be taught in class; that defeats the purpose of integrating technology. However, faculty who know the skills and abilities of students in the class should be able to determine enhancement or transformation tasks. Since the SAMR model requires an awareness of the breadth of technology applications available, this model matches well with faculty who have experienced technology knowledge. Additionally, Chell and Dowling cite Puentedura concluding that "it can up to three years for faculty to successfully use the technology to modify and redefine learning tasks to the extent that the educational process is truly transformed" (Chell and Dowling, 2013, p.2). This seems to indicate that the SAMR model is a guide for faculty to use over time as technology use and educational tasks are practiced and refined.

TPACK

The TPACK model is a framework of technology integration, combining three knowledge areas in seven different ways: Content, Pedagogy, and Technology. In the center of the framework, all three areas are combined as Technological Pedagogical Content Knowledge, or TPACK. This model specifically focuses on the teacher, or faculty member, and the knowledge required to teach a course or program (Koehler, 2012).

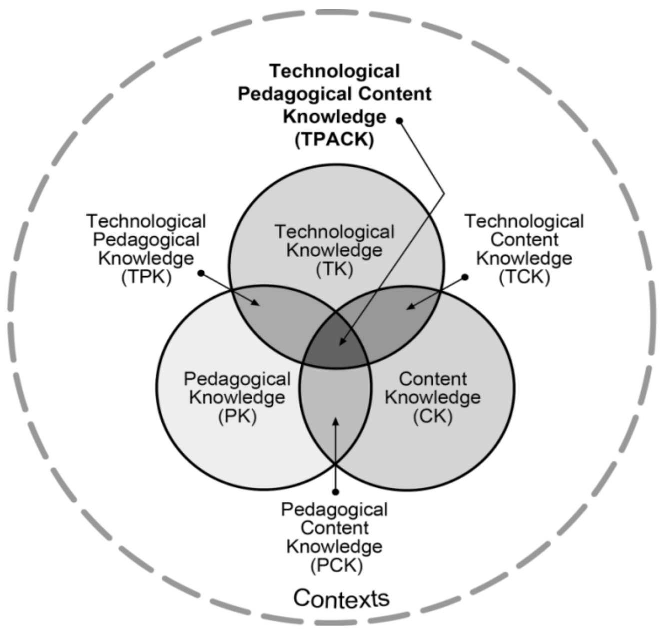


Figure 7. TPACK Model.

Overlapping circles represent each level of TPACK. The singular outer circles are Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). Content Knowledge refers to the knowledge of the subject matter, such as math or science. Pedagogical Knowledge refers to the teaching process, such as lesson planning and assessment. Technology Knowledge refers to the knowledge and understanding of using technology tools and resources (Koehler, 2012).

While these outer circles are singular, they do not act alone. Each singular circle overlaps at least one other circle, because teaching involves more than one of the three singular areas. A great math teacher (Pedagogical Knowledge) would probably not be able to walk in a nursing classroom and teach nursing with no knowledge of the topic (Content Knowledge). The overlapping of two circles creates three combined areas: Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), and Technological Pedagogical Knowledge (TPK). Pedagogical Content Knowledge combines knowing how to teach with knowing the content itself. Technological Content Knowledge combines knowing the technologies needed for the content with knowing the content itself. Technological Pedagogical Knowledge combines knowing technologies and how they address particular teaching processes (Koehler, 2012).

The overlapping circles of two areas probably describe the majority of college faculty, especially the Pedagogical Content Knowledge area. Instructional designers are best described in the Technological Pedagogical Knowledge area. Industry specific faculty, such as accountants or web designers, are best described in the Technological Content Knowledge area. Yet the ultimate level is where all three areas intersect: Technological Pedagogical Knowledge, or TPACK.

In the TPACK center, those who have Technological Pedagogical Content Knowledge are able to combine effective teaching methods with deep content understanding and skilled use of appropriate technology (Koehler, 2012). Koehler and Mishra describe this combination:

> TPACK is the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones. (as cited in Koehler, 2012, para.10)

Few college faculty members fall in this central TPACK area. For academic leadership, the list of TPACK faculty members will be short and the description of TPACK faculty members will be complementary and extensive.

Because of the complexity of the TPACK model, this model matches with faculty who have advanced technology knowledge. Originally, the TPACK model was chosen as the ideal model to use with the product. Faculty could be categorized in the overlapping areas of PCK, TCK, or TPK. Upon further review, it seemed too overwhelming to have a newer faculty member or a faculty member with very basic technology knowledge to be expected to fully comprehend the TPACK model in addition to grasping quality technology integration.

SUMMARY

In this Chapter, student learning and engagement with technology was reviewed, as well as faculty and technology expectations. Theoretical frameworks of technology integration, referred to by the researcher as technology integration models, were explored as a foundational basis for product dissertation. Chapter Three will discuss the creation of the product, connecting the application of the technology integration models and the process of shifting the mindset of faculty.

CHAPTER THREE: CREATING THE GUIDE

THE GUIDE

The uniqueness of a product dissertation is that the active research results in a product with immediate use or application. While a review of the literature is essential to supporting the product, traditional research is not necessarily utilized, and the result is often a creation from the researcher's observations and experiences. The result from this active research is a product in the form of faculty guide.

The purpose of the guide is to provide a collection of technology integration ideas for faculty. Included is a self-identification tool for faculty of his/her technology knowledge level. The technology knowledge level is matched with a technology integration model. Each model has relevant application through best practices of technology integration in the guide. This chapter will discuss the processes that led to the creation of the faculty guide.

CONTRIBUTING KNOWLEDGE AND EXPERIENCE

As the researcher created the guide, work experiences in both K-12 and higher education were considered. The researcher had previously been identified as a lead teacher in K-12 and a quality faculty member in higher education. From these identifications and other professional experiences, the researcher was in a position of faculty development, which greatly contributed to the researcher's knowledge base for creating the guide.

While the foundational contribution was the researcher's own knowledge and use of technology integration as it directly relates to addressing student learning outcomes, the strongest contribution came from the researcher's work with faculty knowledge and comfort levels of technology as well as integration of technology, in one-on-one, small group, and large group situations. It was the work with faculty that inspired the guide as a tool for onboarding new faculty and addressing current faculty concerns.

CREATING THE TOOL

The concept of faculty learning being similar to student learning is not a new one. Approaching the concept of learning about technology integration can be understood by viewing it as decision making process using an innovative concept. Rogers (1983) describes the innovation-decision process as a "series of actions and choices over time through which an individual or an organization evaluates a new idea and decides whether or not to incorporate the new idea into ongoing practice" (p. 163). The individual goes through these five stages: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1983). Similarly, Perry (1970) compares the teaching abilities of faculty to the learning abilities of their students as developing in stages (as cited in Kugel, 1993). Faculty begin with an emphasis on teaching, focusing on self, then subject, then student. From there, faculty shift their to an emphasis on learning, focusing on students as receptive, then active, and finally independent (Kugel, 1993).

Regarding teaching, faculty tend to struggle with new concepts just as students do. The research of Dancy, Henderson, and Turpen (2016) utilized Rogers' innovation-decision process and revealed that "faculty (like students) make sense of new information through their existing ideas" (p. 10). However, rather than recognizing that learning new tools for teaching is part of the natural learning process, the researcher has observed that faculty often dismiss or disregard the learning process and choose to focus on the already familiar teaching tools and processes. The researcher also observed that faculty often blame lack of time for not adding yet another requirement to the current overwhelming amount of responsibilities for teaching a course. Thus, asking faculty to integrate technology in the classroom is often categorized as another requirement of time – time to plan, time to learn, time to implement, and time to revise. This speaks to the fixed mindset of some faculty, where professional development opportunities could assist some faculty through the process of shifting to a growth mindset in order to see the advantages of technology integration.

Much of the literature points to the "one size fits all" method often used (mainly out of convenience of development and distribution) at educational institutions. Hunter (2015) notes that technology integration is not easy, and that many teachers view technology as an 'add-on' that does not help students focus on content. Additionally, Hunter (2015) states that most of the professional development for teachers in technology “work on the assumption that teachers are at the same level of technology skill” (p. 5).

By having faculty self-identify his/her technology knowledge level, it will be easier for faculty to plan, learn, implement, and revise. Kwon (2010) concluded in his research that self-identification is connected to self-knowledge. Schlenker (1986) states that self-reflection and self-disclosure are regarded as attempts to convey accurate information, with the motive being the pursuit of expression or knowledge (p. 22). With these conclusions in mind, having faculty self-identify his/her technology knowledge level will be beneficial to the individual faculty member; there is no consequence tied to the result of self-identification.

The idea is to start with what is known and manageable, not to drastically change. The self-identification tool was created by the researcher to help faculty members understand where he/she fits in the levels of technology knowledge and to use a technology integration model that fits with that technology knowledge level. Some faculty will remain at the same level no matter what, but most faculty will gradually become more comfortable with technology and will move to a higher level of technology knowledge.

Using the self-identification tool, the individual faculty reads six progressive statements (each statement builds on the previous) regarding overall technology experience as a faculty member, and chooses the statement that best describes him/her. The first two statements are matched with a Basic Technology Knowledge Level and a low comfort level:

My overall technology experience as a faculty member can best be described as....

1. *Technology? I don't know how to use that stuff. I know what I am required to know - just the basics.*

2. *I have some general knowledge. I use power points, the overhead projector, and some functions of the LMS. I am comfortable with #1.*

The third and fourth statements are matched with an Experienced Technology Knowledge Level and an average comfort level:

My overall technology experience as a faculty member can best be described as....

3. *I'm pretty knowledgeable because I have occasionally shown videos in class and posted things on the LMS. I am comfortable with #1 and #2.*

4. *I would describe myself as tech-savvy. I regularly use the LMS and other forms of technology in class and outside of class. I am comfortable with #1, #2, and #3.*

The final two statements are matched with an Advanced Technology Knowledge Level and a high comfort level:

My overall technology experience as a faculty member can best be described as....

5. *I would say I'm more advanced. I utilize advanced LMS options, such as inline grading, rubrics, assignment submissions online, and the discussion board. I am comfortable with #1, #2, #3, and #4.*

6. *I'm definitely advanced and am capable of training other faculty/staff in numerous technology applications. I am comfortable with all of the statements (#1-5).*

From here, faculty are matched to a technology knowledge level as described below:

> *If you chose 1 or 2 above, you are at a Basic Technology Knowledge Level. You might require extra training and development. Seek assistance from your campus point of contact in the areas of technology and classroom support, and fellow faculty members who are willing to mentor you in your technology journey. Your comfort with technology is probably low.*

If you chose 3 or 4 above, you are at an Experienced Technology Knowledge Level. You might want to learn more tips and tricks. Seek assistance from your campus point of contact in the areas of technology and classroom support for additional training. Share your technology integration ideas with faculty and discover new ideas in this guide. Your comfort with technology is probably average.

If you chose 5 or 6 above, you are at an Advanced Technology Knowledge Level. You are a valuable asset! Seek out your campus point of contact in the areas of technology and classroom support for opportunities, such as mentoring faculty or leading professional development sessions. Your comfort with technology is probably high.

MATCHING THE TOOL WITH THE MODELS

The researcher was aware that some models existed. During the process, three distinct models were explored: Bloom's Digital Taxonomy, the SAMR Model, and the TPACK Model. Originally, the researcher thought choosing one model would suffice. Upon further exploration, it became apparent that a "one size fits all" model did not make sense. There are so many varying levels of faculty technology knowledge and comfort levels. Each model seemed more or less complex than the others, and each model approached technology integration in a different way.

Bloom's Digital Taxonomy seemed to match with all knowledge levels, and would therefore be the most appropriate for faculty at a low level of technology knowledge and comfort, or the Basic Technology Knowledge Level. In this level, Bloom's Digital Taxonomy offers a simple chart that is closely matched with much of the language used in learning outcomes. This model is perfect for faculty who are either uncomfortable with technology or unsure of how to integrate technology in the classroom to meet learning outcomes.

The SAMR Model appears simple but requires a stronger understanding of the connections between learning outcomes and technology use, and would therefore be the most appropriate for faculty with an average level of technology knowledge and comfort, or the Experienced Technology Knowledge Level. In this level, SAMR offers a perspective of technology integration that changes the purpose of the technology chosen. This model is perfect for faculty who are comfortable with using technology but not entirely sure how technology could or should shift the perspective of technology usage for students.

The TPACK Model is complex, requiring a complete understanding of subject matter, pedagogical methods, and technology. For this reason, the TPACK Model would be the most appropriate for faculty at a high level of technology knowledge and comfort, or the Advanced Technology Knowledge Level. In this level, TPACK brings all aspects of teaching to a central concept of effectively combining technological, pedagogical, and content knowledge. This model is perfect for faculty who are comfortable with all three knowledge areas and are seeking a way to support and explain advanced levels of teaching with technology.

ADDING BEST PRACTICES

Once a foundation was created in the guide for faculty to have a conceptual framework of where he/she fits in the technology integration theory, best practices were added that fit either one or several of the models. The best practices were considered in this manner: determine what practice would assist faculty in planning, learning, implementing, and revising technology while also considering the technology knowledge level and the technology integration model.

While any technology integration model can be used despite the technology knowledge level, the suggested use of the models is scaffolded; as the technology knowledge levels increase, the suggested technology integration models increase. Figure 8 shows how the technology integration models can be distributed across the technology knowledge levels.

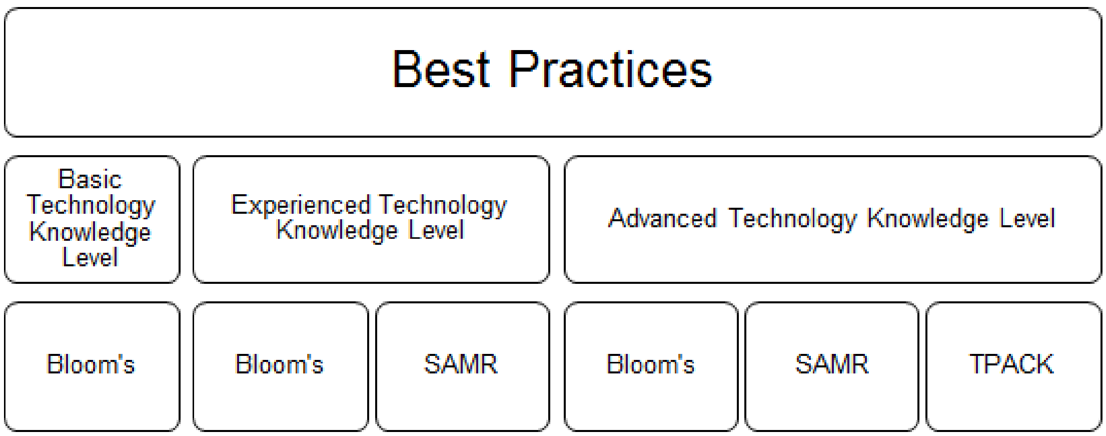


Figure 8. Considering best practices and the distribution across Technology Knowledge Levels and Technology Integration Models.

If technology knowledge is looked at as a kind of language acquisition, the use of effective instructional scaffolding can be explained by the work of Applebee and Langer (1983). The five components are intentionality, appropriateness, structure, collaboration, and internalization (Applebee & Langer, 1983 as cited in Zaho & Orey, 1999, p. 6), are summarized in Table 1. Correlating the five components with the guide results in a better understanding of how the guide can be used.

Table 1: *Five Components of Effective Instructional Scaffolding*

COMPONENT	DESCRIPTION	USING THE GUIDE
Intentionality	The task has a clear overall purpose driving any separate activity that may contribute to the whole.	The purpose of the guide is to provide a collection of technology integration ideas for faculty.
Appropriateness	Instructional tasks pose problems that can be solved with help but which students could not successfully complete on their own.	The guide is designed to supplement professional development opportunities related to technology integration.
Structure	Modeling and questioning activities are structured around a model of appropriate approaches to the task and lead to a natural sequence of thought and language.	The guide provides three technology integration models of increasing complexity to match three increasing technology knowledge levels.
Collaboration	The teacher's response to student work recasts and expands upon the students' efforts without rejecting what they have accomplished on their own. The teacher's primary role is collaborative rather than evaluative.	The guide provides best practices and suggests ways to implement technology ideas, but also suggests collaboration among peers and other academic leaders.
Internalization	External scaffolding for the activity is gradually withdrawn as the patterns are internalized by the students.	The guide allows for continual growth and reevaluation, as well as suggesting continuous professional development.

The component of intentionality, or clear overall purpose, is addressed in the purpose of the guide. The component of appropriateness, or posing problems that can be solved with help, is addressed by the design of the guide as a supplement to professional development opportunities. The component of structure, or modeling, is addressed by the use of three technology integration models. The component of collaboration, or responding without rejecting and acting as a collaborator rather than an evaluator, is addressed by offering best practices and encouraging collaboration among peers and departments of the college. Finally, the component of internalization, where scaffolding is gradually withdrawn so that internalization can occur, is addressed by allowing faculty to grow, continually reevaluate, and reflect with repeated usage of the guide.

SUMMARY

This Chapter gave an overview of the creation of the product (guide) that follows in Chapter Four. By using the self-identification tool of technology knowledge levels, faculty can better understand the technology integration models. The matching of the levels and the models creates a conceptual framework and allows the best practices to be closely tied to the levels and models.

CHAPTER FOUR: THE GUIDE— QUALITY TECHNOLOGY INTEGRATION IN THE COLLEGE CLASSROOM

(the Guide follows this page)

Quality Technology Integration in the College Classroom

A Guide for Faculty

September 2016

Quality Technology Integration in the College Classroom

A Guide for Faculty

Table of Contents

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NOTE: All websites described within were available at the time of the original publication of this guide. Knowing that technology is constantly changing, not all websites may be available. An attempt will be made by the author to update this guide periodically, but is not guaranteed.

Purpose of Guide

The purpose of this guide is to provide a collection of technology integration ideas for faculty.

Why Use This Guide?

This guide was designed with faculty in mind. It was written after over a year of working with faculty in one-on-one, small group, and large group situations in areas of technology knowledge and comfort levels, as well as technology integration.

After reading this guide, you should be able to:

- identify your own technology knowledge level
- familiarize yourself with three technology integration models
- choose one of the technology integrations models that is either matched with your technology knowledge level or that you identify with the most (based on your own teaching experience)
- explore and implement at least one suggested best practice
- find new topics to discuss with colleagues regarding technology integration in the classroom, and reflect on your experiences

What are the professional expectations of faculty?

At your college, what are the basic technology requirements for faculty? Examples include using college email, navigating the college website, and navigating and using functions in the college database system for student records or other related faculty access. They also include operating technology and equipment commonly found in the college classroom, such as a multimedia station with video and audio connected to a projection system. These basic technology requirements will be referred to as *the basics*.

At your college, what Learning Management System (LMS) is in place and what are the expectations for faculty use of the LMS? Examples of an LMS include Blackboard, Canvas, Angel, or similar products. Some colleges offer an LMS as an option while others require the use of an LMS in all courses. The requirements and other uses of an LMS will be referred to as *functions of the LMS*.

You should find out who the point of contact is on your campus regarding basic technology and LMS requirements of faculty at your college. Collectively, these will be referred to as *professional expectations*.

Before You Decide

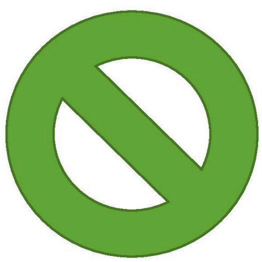
Integrating technology in your lesson, course, or program should be done in conjunction with examining the learning outcomes. Don't just "do" technology for the sake of doing it - instead, determine if the use of the technology you choose will help students meet the outcomes. Will this increase student engagement? Will this help students understand the content in a more meaningful way? Technology usage should enhance the learning experience, not interfere.

Shifting Your Mindset

Integrating technology in the classroom can be uncomfortable to some and exciting to others. By shifting your mindset, or your established set of attitudes about technology, gains can be made in both your professional development and your students' learning.

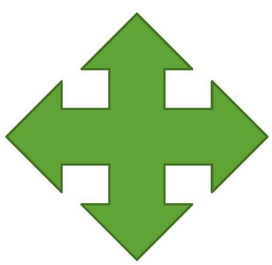
The attitudes you have about technology can be categorized as either fixed mindset or growth mindset. In a fixed mindset, basic abilities, intelligence, and talents are limited to a certain amount; in a growth mindset, talents and abilities can be developed through effort and persistence (Dweck, 2000).

What is your mindset? If it is a fixed mindset, how will you shift it to a growth mindset?



FIXED MINDSET

- Technology won't work in my classroom or my discipline.
- I'm not good at technology.
- I'll never be able to use technology the way some other faculty do.
- Learning new technology or more technology will be hard.
- There is not enough time to integrate technology because there is too much content to cover.



GROWTH MINDSET

- I would like to look for technology that would work in my classroom or discipline.
- I might find technology challenging or difficult, but I'm willing to try!
- Engaging students with technology might get my students excited about learning and more engaged in my class.
- As a faculty member, becoming well educated about the use of technology is important.

Getting Started

To get started, go through the sections below. Check off each section once completed.

☐ *Professional Expectations*

Every college has professional expectations of faculty. What are the basic technology and LMS requirements of faculty at your college? Can you meet them? If not, you should seek assistance from your point of contact on campus regarding training so that you can meet the professional expectations first.

☐ *Technology Knowledge Level*

It will be beneficial to first determine your Technology Knowledge Level and then review the suggested Model. Use the *Determining Your Technology Knowledge Level* tool.

☐ *Technology Integration Model*

Once you know your Technology Knowledge Level, review the Technology Integration Model suggested for your level. The Models are matched to the Levels, but you can choose to use any of the Models described. There is a *Technology Integration Plan* planning template for each Model.

☐ *Shifting Your Mindset*

Whether you are comfortable with technology, excited about trying something new, or very apprehensive, getting started with integrating technology in the classroom requires you to open your mind to possibilities. Examine the purpose of the technology and its potential benefits to student learning and engagement. Don't limit your thinking. Don't be afraid to try something. But also, don't do more than you think you should. If it doesn't seem right, don't use it. Always have a backup plan in case the technology you choose fails to work or doesn't seem to be enhancing student learning or engagement. While learning new technology or trying new teaching methods requires time, the investment of your time will pay off. Take the time to plan, learn, implement, and revise. Meeting learning outcomes with technology can increase student engagement and better prepare students for a technologically connected global world.

5

Determining Your Technology Knowledge Level

Which of the following statements do you identify with the most?

My overall technology experience as a faculty member can best be described as....

1. Technology? I don't know how to use that stuff. I know what I am required to know - just *the basics*.
2. I have some general knowledge. I use power points, the overhead projector, and some *functions of the LMS*. I am comfortable with #1.
3. I'm pretty knowledgeable because I have occasionally shown videos in class and posted things on the LMS. I am comfortable with #1 and #2.
4. I would describe myself as tech-savvy. I regularly use the LMS and other forms of technology in class and outside of class. I am comfortable with #1, #2, and #3.
5. I would say I'm more advanced. I utilize advanced LMS options, such as inline grading, rubrics, assignment submissions online, and the discussion board. I am comfortable with #1, #2, #3, and #4.
6. I'm definitely advanced and am capable of training other faculty/staff in numerous technology applications. I am comfortable with all of the statements (#1-5).

Your Technology Knowledge Level:

If you chose 1 or 2 above, you are at a Basic Technology Knowledge Level. You might require extra training and development. Seek assistance from your campus point of contact in the areas of technology and classroom support, and fellow faculty members who are willing to mentor you in your technology journey. Your comfort with technology is probably low.

If you chose 3 or 4 above, you are at an Experienced Technology Knowledge Level. You might want to learn more tips and tricks. Seek assistance from your campus point of contact in the areas of technology and classroom support for additional training. Share your technology integration ideas with faculty and discover new ideas in this guide. Your comfort with technology is probably average.

If you chose 5 or 6 above, you are at an Advanced Technology Knowledge Level. You are a valuable asset! Seek out your campus point of contact in the areas of technology and classroom support for opportunities, such as mentoring faculty or leading professional development sessions. Your comfort with technology is probably high.

6

Understanding and Using the Models

As you work with your campus point of contact in the areas of technology and classroom support, you may read or hear about one of the three models in this section. They are similar in purpose, but different in approach. No model is the right or correct model, but rather suggestive of what could be done to move you from simple to complex technology integration. These three models have been matched with the Technology Knowledge Levels in the previous section. However, you can choose *ANY* model you identify with the most, based on your teaching experience.

While you create or revise lesson plans, use your model to help guide you through the lesson objectives and learning outcomes, particularly when considering the integration of technology. As discussed earlier, examine the purpose of the technology and its potential benefits to student learning and engagement. If it doesn't seem right, don't use it – but don't be afraid of experimenting! Always have a backup plan in case the technology you choose fails to work or doesn't seem to be enhancing student learning or engagement. A technology integration planning template is provided with each model to help you as you plan technology activities.

In the *Best Practices* section, you will find best practices in three sections: Group Work, Assessment, and Using LMSs. These best practices are <u>not</u> Level or Model specific. They can be used in any Model, but have various applications in each Level.

Basic Technology Knowledge Level and Bloom's Digital Taxonomy

In this level, Bloom's Digital Taxonomy offers you a simple chart that is closely matched with much of the language used in learning outcomes. This model is perfect for faculty who are either uncomfortable with technology or unsure of how to integrate technology in the classroom to meet learning outcomes.

Experienced Technology Knowledge Level and SAMR

In this level, SAMR offers you a perspective of technology integration that changes the purpose of the technology chosen. This model is perfect for faculty who are comfortable with using technology but not entirely sure how technology could or should shift the perspective of technology usage for students.

Advanced Technology Knowledge Level and TPACK

In this level, TPACK brings all aspects of teaching to a central concept of effectively combining technological, pedagogical, and content knowledge. This model is perfect for faculty who are comfortable with all three knowledge areas and are seeking a way to support and explain advanced levels of teaching with technology.

Bloom’s Digital Taxonomy

Bloom’s Taxonomy is a commonly used model in all levels of education. Developed by Benjamin Bloom in 1956, the taxonomy categorizes cognitive objectives and follows the thinking process. Each category builds upon the previous, from lower order thinking skills to higher order thinking skills (Churches, 2008).

The original taxonomy contained six levels: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. It was later modified by a group of psychologists and educational researchers, and retitled as Bloom’s Revised Taxonomy in 2001 with one significant difference; the levels, originally labeled using nouns, were relabeled using verbs. In the revised taxonomy, the six labels are Remember, Understand, Apply, Analyze, Evaluate, and Create (Anderson, n.d.).

The taxonomy was expanded further in 2007 by Andrew Churches to reflect 21st century teaching and learning (Roberts, 2011). Churches added verbs to each level that specifically refer to technology actions, such as searching to coincide with Remembering and posting to match with Evaluating. Some visual aids show the digital taxonomy levels labeled as Doing, Connecting, Applying, Conceptualizing, Evaluating, and Creating, with an additional level added for digital taxonomy at the highest end labeled Sharing.

Bloom’s Digital Taxonomy is simple to understand. Verbs describe the action of the learner and can easily be matched with learning outcomes of lessons or courses. You can use the Bloom’s Digital Taxonomy visual aid to determine if the intention of the technology chosen appropriately meets the desired learning outcome.

Bloom's Digital Taxonomy Model

Bloom's taxonomy	Bloom's modified taxonomy	Bloom's extended digital taxonomy	Thinking Skills
		Sharing	**Higher Order**
Evaluation	Creating	Creating	↑
Synthesis	Evaluating	Evaluating	↕
Analysis	Analyzing	Conceptualizing	↕
Application	Applying	Applying	↓
Comprehension	Understanding	Connecting	
Knowledge	Remembering	Doing	**Lower Order**

Adapted from Fractus Learning(2014)

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Technology Integration Plan – Bloom's

COURSE ID	DATE

LEARNING OUTCOME:

BLOOM'S LEVEL	PLANNED ACTIVITIES
CREATING	
SHARING	
EVALUATING	
CONCEPTUALIZING	
APPLYING	
CONNECTING	
DOING	

10

SAMR

SAMR is an acronym for Substitution, Augmentation, Modification, and Redefinition. The SAMR model was created by Ruben Puentedura for educators and librarians with the purpose of examining levels of technology usage with students (Jacob-Israel and Moorefield-Lang, 2013). These levels are not as clear or commonplace as Bloom's Taxonomy because they are not generalized for education but rather specific to technology usage. Each level represents how technology is used by students to not just complete an educational task, but to enhance or transform it.

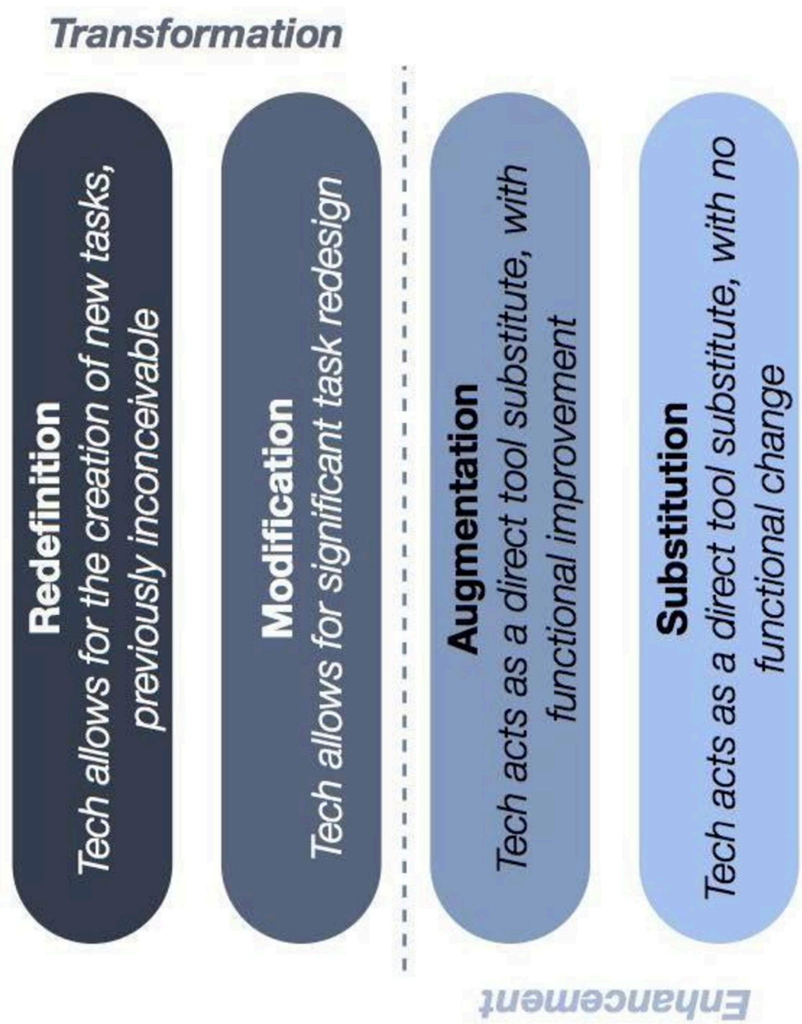
At the Substitution level, technology is used to directly substitute another tool. For example, an e-book might be used in place of a traditional print book. In the e-book, features allow students to highlight, bookmark, and make notes. This is a utilization of technology that enhances the task, but the end result is essentially the same (Puentedura, 2014). The Augmentation level also utilizes technology to enhance a task, yet a functional improvement exists (Puentedura, 2014). For example, an online map can be labeled, and the labels can be hyperlinked to audio, video, documents, or websites that give detail and more in depth explanations of the geographical area (Walsh, 2015).

At the Modification level, technology significantly redesigns, or transforms, the task (Puentedura, 2014). This is seen often in flipped classrooms, where videos and lessons are completed outside of class so that class time can be used for practice or reinforcement. For example, instead of watching a video in class and then practicing or discussing the topic, students would watch the video ahead of time and go directly to the practice or discussion in class (Walsh, 2015). Finally, the Redefinition level completely transforms the task by creating new tasks that would not be possible without technology. For example, instead of writing a report on the Industrial Revolution, students can use a movie application, such as Apple's iMovie, that allows them to add audio, video, and images. This movie can be published and shared, completely transforming the original task of simply writing a report (Puentedura, 2014).

Be careful not to confuse the enhancement and transformation levels. Know your students' technology skills before determining what technology to use. For the transformation levels, it might be helpful to assign partner or group projects so that students can learn a new technology format together or teach a known format to others.

11

SAMR Model



http://hippasus.com/resources/sweden2010/SAMR_TPCK_IntroToAdvancedPractice.pdf

12

Technology Integration Plan – SAMR

COURSE ID	DATE

LEARNING OUTCOME:

SAMR LEVEL	PLANNED ACTIVITIES
REDEFINITION	
MODIFICATION	
AUGMENTATION	
SUBSTITUTION	

13

TPACK

The TPACK model is a true framework of technology integration, combining three knowledge areas in seven different ways: Content, Pedagogy, and Technology. In the center of the framework, all three areas are combined as Technological Pedagogical Content Knowledge, or TPACK. This model specifically focuses on the teacher, or faculty member, and the knowledge required to teach a course or program (Koehler, 2012). Overlapping circles represent each level of TPACK (see Appendix B). The singular outer circles are Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). Content Knowledge refers to the knowledge of the subject matter, such as math or science. Pedagogical Knowledge refers to the teaching process, such as lesson planning and assessment. Technology Knowledge refers to the knowledge and understanding of using technology tools and resources (Koehler, 2012).

While these outer circles are singular, they do not act alone. Each singular circle overlaps at least one other circle, because teaching involves more than one of the three singular areas. A great math teacher (Pedagogical Knowledge) would probably not be able to walk in a nursing classroom and teach nursing with no knowledge of the topic (Content Knowledge). The overlapping of two circles creates three combined areas: Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), and Technological Pedagogical Knowledge (TPK). Pedagogical Content Knowledge combines knowing how to teach with knowing the content itself. Technological Content Knowledge combines knowing the technologies needed for the content with knowing the content itself. Technological Pedagogical Knowledge combines knowing technologies and how they address particular teaching processes (Koehler, 2012).

The overlapping circles of two areas probably describe the majority of college faculty, especially the Pedagogical Content Knowledge area. Instructional designers are best described in the Technological Pedagogical Knowledge area. Industry specific faculty, such as accountants or web designers, are best described in the Technological Content Knowledge area. Yet the ultimate level is where all three areas intersect: Technological Pedagogical Knowledge, or TPACK. In the TPACK center, those who have Technological Pedagogical Content Knowledge are able to combine effective teaching methods with deep content understanding and skilled use of appropriate technology (Koehler, 2012).

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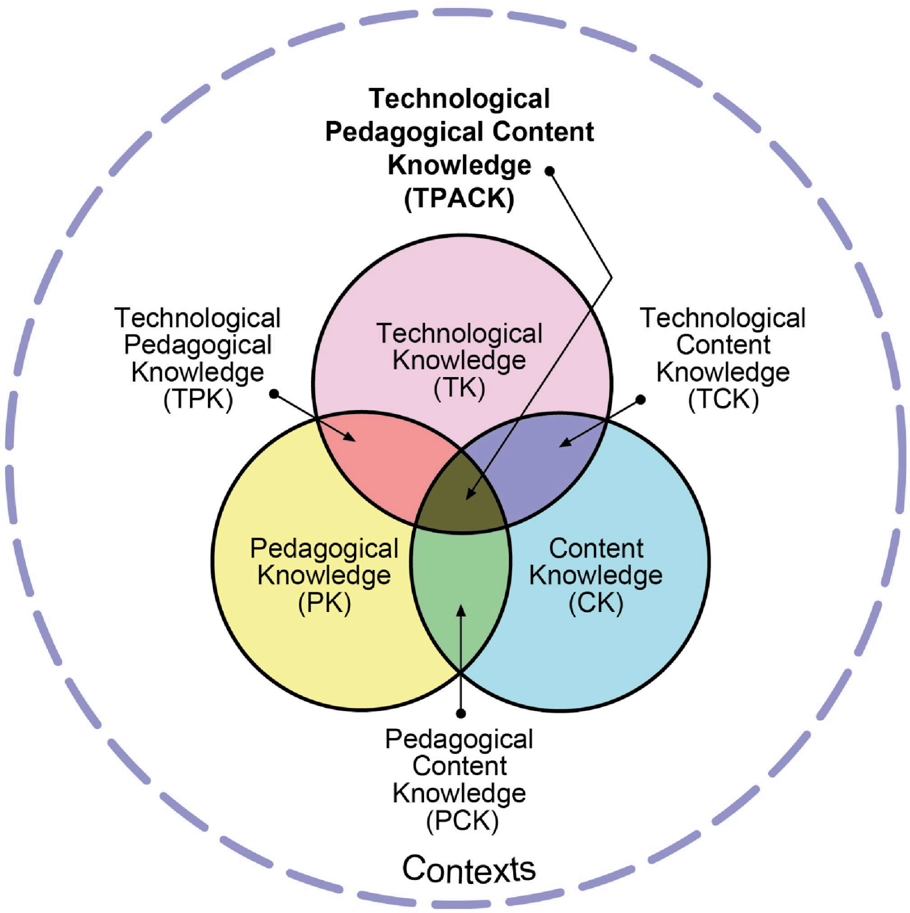
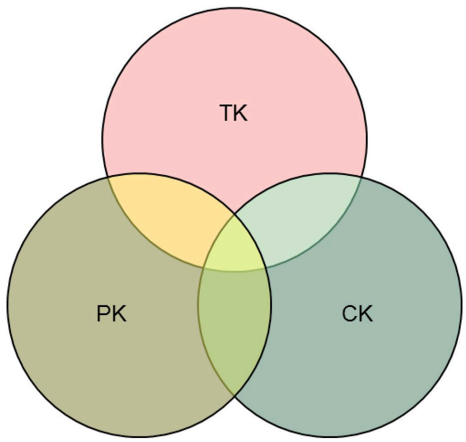
TPACK Model



15

Technology Integration Plan – TPACK

COURSE ID	DATE



LEARNING OUTCOME:

PK:

CK:

TK:

PCK:

CTK:

TPK:

TPACK:

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Best Practices

Now that you know your Technology Knowledge Level and have reviewed the suggested Technology Integration Model, you are ready for the best practices section of this guide. The chart below will help you understand how the best practices are organized.

Group Work	Assessment	Using LMSs
• Research • Projects and Presentations	• Formative • Summative	• Advantages • Online Discussion Tips

Some things to keep in mind...

- Be clear in your classroom expectations regarding technology usage. There are times when you prefer students to put the technology away and pay attention to the human interaction. It is easier to manage this if you make your expectations clear from day one, and you are consistent with the message.
- Are you using a campus computer lab? Are you a BYOD (Bring Your Own Device) campus? Do you allow smart phones (you should consider this for some apps)? Do students need to bring a device daily, or will you let them know which day you expect devices in class?
- Do you have LMS requirements? Does your college require a certain amount of interaction on the LMS? If you go above and beyond the basic LMS requirements, make sure your students know and understand your expectations.
- Start simple. Don't make *drastic* changes to your teaching methods. Just add one thing at a time, but make sure what you are adding will increase student learning and engagement.
- Make sure you comply with ADA requirements and Universal Design. Check with your campus point of contact for classroom support on these issues.
- Remember that not all technology works on all devices. (ex. Microsoft vs Apple, tablet vs. laptop)

Group Work - Research

Allowing students to do research in groups during class time increases the likelihood of cohesive group work. Students can break up the research in to smaller parts and share the results immediately. They can also check the validity or importance of their findings with you, the instructor. Research in groups doesn't need to happen for the entire class time or for the entire research assignment. Instead, schedule at least one time for students to do research in groups so that the group can get started on the right foot, so to speak.

Library Website

Invite your campus library staff to show your students how to utilize the campus library website. Campus library websites typically have online databases, journals, class or subject guides, and other features. When students can effectively use the library website, they are more likely to understand the difference between reliable and unreliable online sources. Additionally, most library websites have the ability to use Boolean search terms (AND, OR, NOT), which can increase the specificity needed for some research.

General Search Engines

Using general search engines, such as Google, Bing, or Yahoo, allows students to find multiple sources of information. On most search engines, they can even narrow the searches to only images or videos. Public opinions are easier to find on a general search engine than on a scholarly or library website. Another advantage to general search engines is that students can find samples of research, papers, projects, etc. that other students have posted. Sometimes, looking at other samples can inspire students to come up with creative results for assignments.

Subject-specific Websites

Rather than using a general search engine, find out what subject-specific websites are out there for your subject area. On subject-specific websites, students can search for subject-specific material instead of filtering out the "junk" from general search engine results. For example, in a business course, you might have students try www.businessmanagement.com. Students can use the site search to find information on *fiscal planning* in the business world, avoiding the extraneous results that are not related to the business field. Or, students in a nursing course might find *charting* results more applicable on www.nursingworld.org than on a general search engine. In an English course, finding specific poems or biographies on poets might be easier on www.poets.org than on a general search engine. Subject-specific website searches can be an intentional way for you to guide your students to more focused research.

Group Work – Projects & Presentations

While research is a component of most group work, this subsection focuses on best practices for projects and presentations. Is it suggested that group work be a significant part of student engagement practices in your classroom. However, this subsection is specifically related to group work that integrates technology for projects and presentations, during class time or not.

Presentation Platforms

There are numerous presentation platforms available online, and many of them are free or have free options. While PowerPoint is a commonly accepted form of presenting, encourage students to explore other options. You might be surprised at the options that students find and choose when you do *not* specify a presentation platform, but giving options will be helpful for students who are unsure of your expectations or are unaware of the available platforms.

The next pages describe some platforms, with information from the platform's associated website if applicable, and some comments about usage of the platform at the end of each description.

Prezi

https://prezi.com

Prezi gives you unprecedented visual storytelling power, combining the freedom of an open canvas with spatial dimension and motion to keep audiences engaged as you guide them through your message.

Prezi is a great replacement for PowerPoint. Some viewers might not like Prezi because it is a motion presentation platform, with options to spin, flip, zoom in, zoom out, etc.

emaze

www.emaze.com

Easily create an engaging and captivating presentation in minutes, with templates:

- Create gorgeous presentations in minutes using Automaze and "Smart" templates
- Enhance presentations easily with all types of video, audio, GIFs, live data, and more!
- Work on it everywhere there's Wifi, works on all laptops, ipads, tablets and phones
- Share and collaborate with everyone through email, social media, websites and blogs

Emaze is another great replacement for PowerPoint. Although it is a motion presentation platform, the motions are not difficult to view.

Google Slides

available in a Google account

Google Slides is very similar to PowerPoint, just with limited templates. The best advantage to using Google Slides is that students never have to save anything – it's automatic – *and* students can work on the same slide presentation all at the same time from any location.

Visme

www.visme.co

Visme is a simple and powerful tool to translate your ideas into engaging content in the form of presentations, infographics, reports, web content, product presentations, and wireframes. Tell better stories and translate boring data into beautiful visual content right in your browser. Share or download using our all in one easy-to-use editor.

Visme is a perfect platform for creating infographics in particular. Courses that require visual representation of data and information may find this a very useful platform (ex. business summary reports, culinary menus, survey results, marketing displays, psychological or medical descriptions).

Canva

www.canva.com

Easily create beautiful designs + documents. Use Canva's drag-and-drop feature and professional layouts to design consistently stunning graphics.

This is a very simple, easy to use platform that might remind you of PhotoShop. It would be best used for presentations that need to be rich in pictures or graphics with few words. Once great use would be for images to be displayed while a group (or individual) is speaking. Imagine a creative writing presentation where students are reading aloud while images are displayed on the screen, or a marketing presentation where students are describing the product in detail while pictures of the product are displayed on the screen.

SlideDog

slidedog.com

With SlideDog, you can create custom playlists for all your presentation files and media. Just drag your files into Slidedog—then arrange, save and play. Everything in one playlist, exactly the way you want it. SlideDog lets you remotely control the presentations and playlist from your smart phone, tablet or secondary computer. You can also share your slides in real-time with the audience. Capture your audience by adding interactive elements to your presentation (Presentation Feedback, Polls, Audience Chat). Slidedog supports all common presentation media including PowerPoint presentations, PDF files, Prezi presentations, pictures, and almost every video format available. Once you load up your playlist with presentation media, SlideDog instantly switches between the files.

This is an excellent option for remote or online presentations, but is probably for more advanced users of technology.

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Assessment – Formative

Formative assessment happens throughout the learning process. When you use formative assessment, you want to find out how your students are doing *right now*, rather than waiting for a final test or exam. Formative assessment can be done in many ways without using technology: a quiz, a show of hands, a brief written summary. Using technology adds a different aspect of engagement. It also allows instructors to keep track of data, create reports, and reuse assessments.

When searching for a formative assessment technology, start with your course materials. You might have some readily available formative assessment tools within your course textbook publisher's materials. You might have some linked course assessment tools within your course LMS. Your department or program area might have some predetermined assessment tools also. If you search for outside formative assessment technology, make sure that you understand how to use the tool and its features.

The next pages describe some formative assessment technologies, with information from the associated assessment website, and some comments about usage of the tool at the end of each description.

Kahoot!

https://getkahoot.com

Create: Create a fun learning game in minutes (we call these 'kahoots'), made from a series of multiple choice questions. Add videos, images and diagrams to your questions to amplify engagement!

Play: Kahoots are best played in a group setting, like a classroom. Players answer on their own devices, while games are displayed on a shared screen to unite the lesson – creating a 'campfire moment' – encouraging players to look up.

Share: Social learning promotes discussion and pedagogical impact… whether players are in the same room or on the other side of the globe! After a game, encourage players to create and share their own kahoots to deepen understanding, mastery and purpose.

Resources for use are available once you create a free account. There is even an option to download results from all 'kahoots' so that you can view the data, make comparisons, etc. This formative assessment tool can be used on any device, including smart phones. There are three modes: Discussion, Survey, and Quiz.

Poll Everywhere

www.polleverywhere.com

This is how it works:

- Ask a question - Ask your audience a question with the Poll Everywhere app
- Receive responses from audience - Audience answers in real time using mobile phones, Twitter, or web browsers
- See responses live - See your response live on the web or in a PowerPoint presentation

Poll Everywhere allows for multiple polling options: multiple choice, free response, true or false, clickable images, and Q&A.

You can save the polls for future use, view the results, and share the results. You can even embed a polleverywhere link in a PowerPoint or Google Slides presentation.

nearpod

https://nearpod.com

Easily create lessons in minutes for your next class. Import files (pdf, ppt, jpg) or Google slides and add interactive activities, websites, and videos to keep your students engaged in their learning. Synchronize your lessons across all student devices in the classroom. Get real-time feedback and post-session reports on student comprehension.

1. Create or download interactive multimedia presentations
2. Share your interactive lesson and control the student's activity in real time
3. Your students interact and submit responses through any mobile device or PC/MAC
4. Monitor and measure student results on an individual and aggregate basis

Using nearpod has many advantages. You can access the presentation on a tablet and control the advancing from your tablet as you walk around the room instead of being tied to a PC station. You can "force" what slide a student is viewing because it "takes over" the student's phone, tablet, or PC/MAC (permission is given by the student). You can embed questions as you go in multiple formats and view the results in a report. This is a great alternative to the traditional lecture format. It does require a more experienced level of technology usage and a higher comfort level, but saves lots of prep time for repeated lessons. Once you learn how to use nearpod, you have presentations, videos, and assessments built in to one platform.

Google Forms

available in a Google account

Google Forms allows you to create a survey, quiz, or similar assessment that automatically populates the answers on a Google Sheet (spreadsheet). No matter what your technology level or comfort, you can easily use Google Forms for simple formative assessment. Several question options are available, including multiple choice, short answer, and Likert scales. Also available are add-ons that can grade the assessment, but these are more complex. There are numerous resources available to show you how to use Google Forms for assessment.

Assessment – Summative

Summative assessment happens at the end of a learning unit – section, chapter, topic, concept, course, or however you choose to define the unit. When you use formative assessment, you want to find out how your students grasped the entire learning unit. Summative assessment can be done in many ways without using technology: a final test, final presentation or speech, a research report, a capstone project, etc. Using technology enhances the summative assessment process and helps students understand the real world connection.

Traditional summative assessments, such as chapter tests or final exams, still hold value despite the push for increased use of technology. Look for technology enhanced ways to launch traditional summative assessments. Start with your course materials. You might have some readily available summative assessment tools within your course textbook publisher's materials. You might have some linked course assessment tools within your course LMS. Your department or program area might have some predetermined assessment tools also.

Consider using one or several of the technologies described in Group Work – Research, Group Work – Projects & Presentations, and Assessment – Formative. As you work through your *Technology Integration Plan* planning template for learning objectives that require formative assessment, look for ways to get students truly engaged in the assessment process.

Advantages to using technology for summative assessment

Instant feedback

When used correctly, technology enhanced summative assessments provide students with instant feedback for items that can be graded within the technology tool. Students no longer have to wait for the test to be handed back to them. They can immediately review what they missed and begin the process of relearning concepts or material.

Real world connections

If your course has required assessments, use them. However, if you have options for assessments and assignments, consider the value of non-traditional tests. When students have alternate ways to prove they learned the unit expected, they are more likely to be able to express what they have learned and make it both meaningful and lifelong. For example, instead of requiring students to just write individual research papers on a topic, add a presentation piece to it that utilizes technology. The writing portion is very important and should not be dismissed, but the sharing of that research and writing helps students truly understand the learning unit. It also allows students to experience what they might have to do in a work situation: a formal speech or presentation, a board report, a conference call with video sharing.

Using LMSs

Learning Management Systems (LMSs) are powerful platforms for teaching and learning. No matter what LMS your college uses, there are tons of resources available through the LMS support website, on the internet, and through your campus point of contact in the areas of technology and classroom support.

At your college, what LMS is in place and what are the expectations for faculty use of the LMS? Make sure you find out this information, and abide by the professional expectations. However, there are probably additional functions of the LMS above and beyond the professional expectations that could make your life as a faculty member much easier, and that will be advantageous for students too.

This section will discuss some advantages of using LMSs that you might not have considered, and will give some tips for online discussion.

Advantages of Using an LMS

- **Say it once**: Post announcements or documents with details about assignments, expectations, due dates, changes to the schedule, etc. Students can check the LMS for information at any time to find information and answers.
- **Decrease the paper trail**: Students can submit papers and other assignments online. You can grade them online instead of collecting papers, writing on them, and handing them back later.
- **Use the gradebook feature**: No more students asking how they are doing in your class! Record every single grade online in the LMS gradebook feature. Students have access to their grades at any time, as long as you keep up with the posting of grades.
- **Save class time**: Testing and other types of assessments can be done online in most LMSs. Consider shifting the way you look at testing by taking advantage of online assessments. Use class time for activities, projects, and presentations instead. You can also load "lectures" online for students to view, and then use class time to review portions that need clarification (flipped classroom).
- **Link publisher materials**: Most textbook publishers have online materials that can be linked through your LMS. Find out which features will enhance the student learning experience and expand resources for students to learn and study.
- **Engage students outside of the classroom**: Use the online discussion feature of your LMS to allow students to take more time for critical thinking and to continue class time discussion online, as well as covering additional material. The next subsection gives tips on using LMS online discussions.

Online Discussion Tips

Online discussions (typically called Discussion Boards or Discussion Forums) are a key component to online-only courses. In online courses, students rarely or never meet in person, so the discussion component becomes the virtual classroom. For traditional courses, where at least half or all of the class meetings are face-to-face, using the online discussion feature of the LMS has numerous advantages for student engagement and learning.

The most important thing to remember is that online discussions should be exactly that – *discussions*. Not a place to post questions and answers, not an informal communication module or social space, but a place to discuss course material and concepts with critical thinking at the core.

Keep these tips in mind when utilizing the online discussion feature of your LMS:

- Determine the length of time needed for each forum – days, weeks, term.
- Assess each student's contributions by using a rubric and assigning a grade.
- Discuss netiquette ahead of time, either in class or by posting a document online.
- Don't ask questions that don't require critical thinking (yes-no, information recall).
- Create open-ended prompts that allow multiple viewpoints.
- Require students to respond to each other; no required responses = no engagement.
- Get creative! Use a variety of forums throughout the course to meet learning objectives.
- Remember – online discussions give every student an equal chance to "speak" in class.

Creative forums

- Post a video in the forum prompt that relates to the current course topic. Students view the video and post their own reactions, and comment on other students' reactions.
- Post a case study to read. Students respond to the case study, and comment on other students responses to either affirm or dispute the response.
- Have students post a video demonstrating a competency, giving a short speech, or explaining a topic. This allows students to view all at once or in segments, and can either save class time or expand class time, depending on the circumstance.
- Use online discussions for makeup days, class cancellations, sensitive topics, or material that was not covered during class time.

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Reflection

Take some time to reflect on your thoughts, feelings, and experiences after using this guide. What changed? What will you do next? What questions remain unanswered and how will you find answers to them?

Just because something doesn't do what you planned it to do doesn't mean it's useless.

- *Thomas Edison*

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CHAPTER FIVE: IMPLICATIONS AND SUGGESTIONS FOR FUTURE DEVELOPMENT

INTRODUCTION

Technology is not going away. If anything, we should expect technology to become increasingly infused in our daily lives. Things that we never imagined would be done by anything other than a human are slowing being done through technology. However, technology advances faster than the general population can consume it and learn how to use it. In some cases, the technology is considered out-of-date as soon as someone feels comfortable with the operation of the technology.

Does this mean that we should stop using technology in the college classroom? Are we wasting time by expecting faculty and students to learn and use technology? The researcher's immediate response to these questions is overwhelmingly no. While it is frustrating to master one technology only to find out that another version has replaced it, there is no reason to consider not using technology in the classroom.

LIMITATIONS AND ASSUMPTIONS

The guide was created for faculty at small colleges with no formal Center for Teaching and Learning (or similar) and is not a complete document that covers every aspect of integrating technology in the college classroom. The researcher assumes that most faculty will not read a textbook on integrating technology in the classroom, but do want some sort of resource to refer to either as a new faculty member with no teaching experience or formal teacher training, or as a current faculty member seeking to begin or enhance technology integration.

There is a plethora of literature that covers why technology integration is important, but limited literature that suggests how to integrate technology in the classroom. The researcher has anecdotal information that suggests faculty need something to push-start them. Additionally, the researcher assumes that many faculty want to know where they fit in the overall spectrum of faculty technology knowledge. Often, it seems, faculty compare themselves to others and believe their technology knowledge is inferior to the majority of their colleagues. A self-identification tool, some suggested models of technology integration, and a collection of immediate ways to consider integrating technology have been repeatedly requested, in some format, by faculty the researcher has worked with in recent years.

The researcher acknowledges that the guide is limited to only a few suggestions. The priority areas were assumed to be in engaging students through group work, assessment in both formative and summative means, and using Learning Management Systems with a particular emphasis on the online discussion function.

Finally, this dissertation is limited to the experiences shared with the researcher in a small independent college where the researcher is employed, as well as colleagues from community colleges in several states. The college where the researcher is employed does not have a formal Center for Teaching and Learning (or similar). It is assumed that most medium to large community colleges have a Center for Teaching and

Learning (or similar). This guide may or may not be useful for faculty of such community colleges, or for large universities.

SUGGESTIONS FOR FUTURE DEVELOPMENT

Sharing the guide with other college campuses is considered to be a significant means of collecting reactions and suggestions for improvement and updates to the original published version. Because the guide is limited to the experiences of the researcher and interactions with the researcher's colleagues, universally shared experiences across higher education institutions is unknown.

Should the guide prove to be useful to colleges of varying size and resources of support, a continual update of the guide would be worthwhile. There is no one-size-fits-all or encompassing solution to the growing need to develop faculty in the area of technology integration in the classroom. As technology changes and faculty populations flux, the guide will probably contain obsolete information within the next decade. However, the researcher believes that the guide will be useful immediately, and that the technology integration models described in the guide are not limited to any specific technology time period.

This guide could be used as an intervention for faculty who either express concerns over integrating technology in the college classroom or are not integrating technology at all. By offering the guide to faculty, the learner-centered philosophy is reinforced; the guide simply guides faculty and offers a few suggestions, but does not replace any lessons or content. Additionally, each technology integration model has a planning template that requires faculty to learn the model and plan accordingly.

Further research could be done to help update and improve the guide. A pre and post study of a select group of faculty, a department, or other population segment could be conducted. The study could have a pre-study survey, offer the guide for a selected time period (i.e. term or academic year), and follow with a post-study survey. This format would provide the researcher data on the measureable impact of the guide on faculty by comparing pre-survey and post-survey results in both quantitative and qualitative results.

Finally, the guide can serve as a means of professional development for faculty: one-on-one, small groups, with mentors, large groups, term or academic year theme. Offering the guide to faculty before, during, or after faculty observations or evaluations might prove to be beneficial to faculty, students, and academic leaders in situations where faculty members need to improve or enhance teaching methods by integrating technology effectively.

CONCLUSION

It is the responsibility of academic leaders and the institution to support the shift of mindset of faculty from looking at technology integration as “something we have to do” to “something we always do” so that faculty, as a whole, have a more positive attitude towards technology. Education requires taking something that seems complex and making it simpler for all learners. Those learners include faculty, who should always be considered learners despite their title in the classroom.

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