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Exploring College Instructors' Integration of Technology into Their Curriculum

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COLLEGE OF EDUCATION

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Junior Martin

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Abstract

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MS, Nova Southeastern University, 2001

B.Ed., University of Technology, Jamaica, 2004

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Technology integration in the curriculum remains a challenge at different levels in the education system. In one Caribbean 4-year college, faculty are expected to prepare preservice teachers to integrate technology in classroom instruction. When preservice teachers are not prepared for technology integration, interventions are necessary to address this challenge of technology integration. The purpose of this qualitative bounded intrinsic case study was to gain an understanding of the process of technology integration by instructors at the research site. Davies' theory for understanding technological literacy and the technological, pedagogical, and content knowledge model conceptually framed this study. A purposeful sample of 13 instructors who integrated technology in their curricula and volunteered to participate were observed, interviewed, and provided documentation to explore how they integrated technology in their courses. Data were coded typologically using a priori codes and inductively to identify major themes regarding instructors' challenges and perceptions of technology integration. Instructors were consistent in their integration of technology, increased technology use when they held a positive view of technology, and did not use sufficient web-based tools. They expressed a need for additional technology integration training, because there is an absence of training opportunities offered in the area of technology integration. Based on these findings, a 3-day technology integration workshop was created for the instructors. These endeavors may contribute to positive social change by empowering instructors to adopt pedagogy that can transform the college classroom environment and can support instructors' teaching and learning, thus, preparing preservice teachers to embrace technology in their classrooms.

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Dedication

I dedicate this dissertation to my family for their continued love and support throughout this process. Thank you for believing that I could do ‘exceedingly abundantly above all [I could ever] ask or think’ (Ephesians 3:20). To my wife, Yvette, thank you for being an example of a strong and dedicated woman. Thank you for never giving up and for your continued encouragement. To my son, Shaun, you have proven that success lies within. I am so proud of the young man you have become. Always remember, greater is still ahead! To my mother and supporter, Mrs. Rema Martin, your words of prayer strengthened me when I wanted to give up. Thank you for pushing me beyond what I could ever imagine. To God be the Glory, for the Things He has done! To my sister-in-law, Mrs. Rose Grima; and mother-in-law, Miss Icema Flowers, your prayers and encouragement were sources of strength in my times of struggle.

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My doctoral journey was defined by kind assistance I received from many persons along the way. I had the benefit of tremendous generosity and committed support from these individuals, making my journey successful and comforting. This medium does not afford me the space or time to mention everyone who played a significant role, but I wish to take the opportunity to highlight a few of these persons.

Special thanks to my mentor and dissertation chairperson, Dr. Tom Cavanagh, who proficiently guided me throughout this journey. Thank you for sharing your expertise to ensure that I would successfully complete this voyage. To my committee member, Dr. Carol Phillips, thank you for your attention to details and for believing in this study. Your words of encouragement were sources of inspiration. To my university research reviewer, Dr. Mary Howe, thank you for your thorough and helpful evaluation of this body of work.

I am indebted to members of The Mico College who made the study possible. Their encouragement reminds me of the words of Harriet Tubman: “Always remember, you have within you the strength, the patience and the passion to reach for the stars to change the world.” Special thanks to Prof. Edwin Jones and Prof. Claude Packer who never gave up on the dream of my success in completing this task.

Finally, thanks to all my friends, family and Walden colleagues for the kind words and inspiration along the journey.

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Section 1: The Problem

The Local Problem

The rate that instructors integrate technology into their classrooms can be attributed to different factors, including the availability of resources to facilitate the process of integration. Additional factors, such as increasing the access to technological resources in the classrooms and providing instructors with greater opportunities to integrate technology into the curriculum, are standard interventions for improved pedagogy practiced by some institutions (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). These personal, institutional, and technological factors have contributed to the lack of instructor technology integration skills, lack of instructor confidence, limited access to technology integration resources, and restrictive curriculum (Buabeng-Andoh, 2012). There is a need for institutions assist the instructors with integrating technology successfully into the curriculum. The benefits of such interventions could create a classroom learning experience for students represented by modern pedagogies that promote motivation and enjoyment among students. Colleges and universities should create mechanisms capable of establishing systems that will facilitate the successful integration of technology into the curriculum.

Further research on the impact of technology integration by instructors in higher education on students' learning could guide the instructors during the implementation of technology into the classroom. According to Garner and Bonds-Raacke (2013), there is additional research to discover the various means of influencing instructors to integrate technology into the classroom. The increased presence of technology in the classroom

has stimulated the search for new data to effectively manage the process of technology integration in an effort to guide students to the successful achievement of the desired learning outcomes (Kopcha, 2012). The findings of this study can provide information on the process of technology integration in the classroom. In this study, I explored how instructors integrated technology into their curriculum in an effort to find solutions to limitations in pedagogy. These limitations included the instructors' inability to demonstrate modern teaching methods, integrate modern technologies in their teaching, and implement authentic assessment strategies in the classroom.

Definition of the Problem

There are challenges associated with the integration of technology in education that can inhibit implementation. Some of the general problems are designated as barriers to technology use. Common barriers include inadequate technology resources, unreliable technology, and poor technological support, which discourage instructors from using technology and heighten the anxiety of those instructors who are interested in using it (Wachira & Keengwe, 2011). The existing gap between the amount of technology available and the instructors' use of these technologies has contributed to the presence of these barriers (Kopcha, 2012). There is a connection between the need to address these barriers and achieving the implementation of successful technology integration in colleges and universities. A need arises for meaningful interventions, guided by research, to effect solutions to the barriers affecting technology integration. The outcomes of this project study can contribute to a list of interventions required to address the challenges posed by the barriers to technology integration. One of the strategies that I employed in

this study was exploring how the process of technology integration can assist instructors and institutions with data that fuel the identification of effective solutions to the general problems associated with the process.

Chancellor Institute (CI), the site of this study, is a pseudonym for the 4-year college located in the Caribbean. This institution had a student population of approximately 2,500 students and a faculty of 120 instructors at the time this study was conducted. The institution offered both full-time and part-time programs at the bachelor's and master's degree levels in the area of teacher training. Students enrolled in these programs were trained to teach at the early childhood, primary, and secondary levels. All the programs were offered face-to-face in the Faculty of Education, Faculty of Humanities and Liberal Arts, and the Faculty of Science and Technology. The graduate school managed all graduate programs. Instructors were encouraged by their supervisors to integrate technology into their teaching in an effort to engage their students more meaningfully.

A survey was conducted to determine the instructors' readiness in the area of methodology and technology integration. The participants indicated that 35% of the instructors at CI demonstrated the required competency. The vice president of academic affairs expressed concerns about the large number of instructors who failed to meet the required competency. The publication of the survey results was followed by recommendations from the vice president for the implementation of a training program to address the weaknesses among the instructors. The program failed due to the absence of an organized body to manage the process. The survey results and the absence of a

suitable intervention to address the limitations of the instructors to integrate technology represented a gap in practice and provided an opportunity to conduct this study.

Rationale

Evidence of the Problem at the Local Level

The 120 instructors at CI were encouraged to voluntarily participate in a special training program designed to improve their competence in the integration of technology into the curriculum. Before the implementation of the training program, a total of 12% of the lecturers at the institution were duly certified in technology integration. During the implementation of the training program, challenges such as poor attendance and scheduling issues affected the outcome of the technology intervention. The training program failed to achieve its objective of successfully training the instructors at CI in technology integration. The management of the institution expressed concerns about the failure of the training program.

The director of human resources at CI shared the results of the analysis of the student evaluation of the programs at the institution. These student evaluations were completed after the implementation of the training program and were specific to the institution's programs and the performance of the instructors. In a discussion with the e-director, she indicated that the students remained dissatisfied with the limited technology integration demonstrated by some instructors in the programs offered in the social sciences and other departments. The students' evaluation stimulated discussions among the instructors about different intervention programs that could improve their ability to integrate technology in their curricula. These discussions contributed to the decision to

conduct a study on the extent that the instructors were integrating technology in their curricula.

The ongoing evaluation of the use of technology by students can provide a deeper understanding of the students' involvement in the process. According to Kyei-Blankson and Nur-Awaleh (2010), it is important to investigate whether the technology expectations of the current generation of students are being met based on their evaluation of instructors' use of technology in the classroom. Although some of the instructors at CI benefited from training in technology integration, the students were still dissatisfied with their use of technology in the classroom. A total of 72% of the students who completed the evaluation from the social sciences department were dissatisfied with their instructors' use of technology. Table 1 provides further insights into the students' responses to the instructors' attempts to integrate technology in their lessons. Table 1 shows that the Pearson correlation coefficient for the student loyalty and instructor use of technology was significant at the 0.01 level for the 2-tailed distribution.

Table 1

Pearson Correlation between Student Loyalty and Instructor Use of Technology

	Student Satisfaction	Use of Technology Instructor
Student satisfaction	1	.68**
Teacher use of Technology	.68**	1

Note. ** Correlation is significant at the 0.01 level (2-tailed).

There was a significant correlation between the student satisfaction and instructor use of technology, $r = .68$, $p < .01$. The students were more satisfied with their instructors

when the instructors used technology. According to the evaluation, some instructors were not integrating technology enough in their curricula. The responses by the students based on the evaluation results provided a platform to conduct further investigations into the instructors at CI use of technology.

Evidence of the Problem from the Professional Literature

It was unknown how instructors at CI were integrating technology into their classrooms. While many different measures were developed to evaluate instructors' level of use of technology and factors that influence instructors' use of technology, not much progress has been made in the area of instructors integrating technology into their lessons (Davies, 2011; Howley, Wood, & Hough, 2011; Hsu, 2010; Lui, 2011). According to Garner and Bonds-Raacke (2013), the National Center for Educational Statistics (NCES, 2000) indicated that only one-third of instructors surveyed were well prepared to integrate technology into the classroom. Teacher education at the university level does not dictate the inclusion of technology as an essential component of the curriculum. Therefore, the purpose of this study was to gain an understanding of the integration of technology into the classrooms of the college instructors at CI.

Definitions

Curriculum: The subject area or topic of a course taught by the instructors, including the application of technology skills, information skills, and curriculum outcomes (Eisenberg, Johnson, & Berkowitz, 2010).

Integration of technology: The instructors' use of technology to harness the needs of students, the curriculum, and available technology, as well as lesson planning and

media design processes, by combining them into practice to enhance learning (Hsu, 2010).

Significance of the Study

There is a need for additional research on the integration of technology in the classroom at the postsecondary level. In this project study, I addressed the low levels of technology integration into the curriculum by instructors at CI and the need for additional research in the field (Hutchinson & Reinking, 2011). The results of this study provide insights into strategies that are employed to increase instructors' integration of technology into their classrooms at CI. Insights from this study could assist college instructors to develop a greater awareness of the value of integrating technology into their classrooms.

An examination of the role of instructors in the achievement of successful technology integration can provide further insights into the development of strategies to improve the pedagogy of instructors while integrating technology. According to Ottenbreit-Leftwich et al. (2010), improving the frequency at which instructors integrate technology into their lessons is expected to change their attitudes toward technology integration, which in turn, may help improve students' motivation to learn. The students at CI expressed some levels of lack of motivation to participate in class activities due to the low levels of technology integration demonstrated by their instructors. An analysis of the results from evaluations completed by students in the Faculty of Humanities and Liberal Arts showed that 62% of them reported instances of a lack of motivation during their classroom experiences. Table 2 shows that students were motivated after

participating in the technology integration learning activities, using the paired-samples *t*-test on student-learning motivation.

Table 2

Paired-Samples t-test on the Learning Motivation of the Students

	Group	Mean	Standard Deviation	*t*(39)
Learning Motivation	After participating in learning activity	4.86	1.14	5.398
	Before participating in learning activity	4.06	1.01	

**Note*. *n* = 40

Two interviews were carried out to gather survey participants' perceptions with a focus on learning motivation when the principles of technology integration. According to the results of the study, some of the students did experience a lack of motivation towards participating in class activities during their interaction with their instructors. The lack of motivation experienced by students was a contributing factor to their level of participation in learning activities. There was an expectation that the analysis of the relationship between student participation and their level of motivation could play a role in the selection of an appropriate intervention in the classroom.

Research Questions

In this study, the need for instructors at CI to change their current pedagogical approaches and to explore technology integration as a method of teaching was the central focus. The purpose of this study was to discover how the instructors implemented technology integration into their teaching in an effort to improve the overall effectiveness

of the learning experiences for their students. It was my aim to determine the extent to which the implementation of technology integration was currently being done by instructors at CI using Davies' (2011) model for evaluating technology integration. Current research on the implementation of technology integration in higher education has shown a shift from traditional teaching tools toward the use of new technological tools and strategies by instructors (Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012). The instructors at CI had not been implementing technology integration sufficiently into their teaching.

In alignment with the research problem and purpose, the following research questions (RQ) were posed:

RQ1: How does a group of college instructors from the social sciences department at CI describe the integration of technology into their classrooms?

RQ2: How does a group of college instructors from the social sciences department at CI demonstrate the integration of technology into their classrooms?

RQ3: How does a group of college instructors from the social sciences department at CI document the integration of technology into their classrooms?

The design of the research questions provided a platform to explore the extent to which the instructors were integrating technology in their lessons. These broad, open-ended research questions were posed to focus the study, and at the same time, allow me to remain open to what would emerge from the data (Bogden & Biklen, 2007). According to Stake (1995), during the processes of data collection and data analysis, the research questions are refined and modified and additional are questions posed to fit better with

how the study is framed by the data. However, after analyzing the data, there was no need to revise the research questions because the findings provided an answer to the questions posed. The methodology of the study was effective in the context of successful analysis of the role of the instructors in technology integration. The presentation of a detailed research design, its application to the research questions, and the synchronization of the data collection with the analysis of data provided a description of the methodology applied in the study.

Review of the Literature

This literature review consists of two parts: (a) the conceptual framework wherein I outline the ideas and theories that formed the lens through which decisions were made about data collection and analysis and (b) a critical review of the literature wherein I discuss the current conversation in the research literature related to the central phenomenon. The following databases were used in order to search the current literature in the field: ERIC, Education Research Complete, Education for SAGE, and ED/IT Digital Library. The following search terms were used to find the articles: *faculty, instructor, college, university, technology, technology integration, curriculum, syllabus, technology use, Information and Communications Technology (ICT) integration, teaching/learning strategies, education technology,* and *ICT technologies*. A total of 30 articles from the last 5 years were reviewed in preparation for the writing of this literature review.

Conceptual Framework

There were two conceptual frameworks that guided implementation of this study. The evaluation of educational technology developed by Davies (2011) and the technological, pedagogical, and content knowledge (TPACK) model (Berrett, Murphy, & Sullivan, 2012) frameworks were selected based on their influence on the successful implementation of technology integration. Both frameworks were designed to guide the collection and analysis of the data for this study. I selected the frameworks to create the path for the analysis of the data collected in the context of providing the answers the research questions posed in the study.

The characteristics of both frameworks determined the typologies that I used to analyze the data that were collected. According to Tondeur et al. (2012), the use of key themes for content and delivery methods is important in the preparation of higher education instructors for technology integration into the classroom. Content and delivery methods play a role in the analysis of instructors' preparation to use technology in the classroom (Davies, Dean, & Ball, 2011). Using themes associated with content and delivery methods as the initial themes designated to analyze the data created an opportunity for the analysis to be comprehensive. Furthermore, the application of inductive analysis, which followed typological analysis, validated this process. Consequently, the combination of both analyses provided the requisite answers to the research questions posed in this study.

Evaluating technology integration. The framework for evaluating educational technology integration includes a continuum on which an understanding of technological

literacy exists. The three levels that characterize the continuum are awareness, praxis (i.e., training), and phronesis (i.e., practical competence and practical wisdom; Davies, 2011). The levels on the continuum are a representation of the highest levels of technology literacy learners could achieve based on their interaction with available technology tools and practice during technology integration (Davies, 2011). The levels on the continuum constitute three dimensions of the critical actions required by instructors during their evaluation of the process of technology integration (Dush, 2014). Because instructors are expected to successfully execute proper evaluation of technology integration, their competence in the awareness, praxis, and phronesis as levels to be achieved during their implementation of technology integration is critical. Knowledge of the evaluation of technology integration is an important element in the analysis of the ability of participants in this study to successfully infuse technology in their lessons.

The assessment of the level of technology literacy demonstrated by the instructors during their practice of technology integration was an important element of this study. The assessment of the technology literacy of instructors and their students provided an awareness of the use of available technologies as an indicator of the highest level of technology and literacy achieved during technology integration (Davies, 2011; Hutchinson & Reinking, 2011). Instructors who lack the competence to integrate technology successfully into the curriculum are able to improve their competencies in the field (Buabeng-Andoh, 2012). The competency of instructors to integrate technology into the curriculum must be taken into consideration as a part of the implementation of the process. While the methodology required to achieve this objective is dependent on factors

such as the context of the implementation and the institution's preparedness, this section presents pertinent data to support the need for the assessment of instructors. Evaluating technology literacy in the study provided the link between the pedagogical delivery of instructors and the response of their students to the appropriate technology tools during technology integration.

Exposing the students to technology integration establishes and increases their awareness level of educational technologies at their disposal, their functions, and uses. This was the basic level of technology literacy, and it provided students with an opportunity to learn new technologies (Davies, 2011). The transition toward the praxis level involved engaging students in technology related activities to become familiar with the uses and functionality of different technology applications (Ruggiero & Mong, 2013). The movement on the continuum is extended when students achieve the phronesis level where instructors guide the students toward integrating different technologies to achieve their learning outcomes (Davies, 2011). Therefore, instructors participating in the process of technology integration are required to execute the continuum during their teaching (Hutchinson & Reinking, 2011). The teachers must demonstrate all of the levels on the continuum during instruction as well as their impact on the process of technology integration.

The TPACK model. I chose the TPACK model to guide the process of analyzing the details of the approach taken by the instructors during the integration of technology into their curricula. The TPACK model is a theoretical framework designed for understanding instructor knowledge required for effective technology integration (Celik,

Sahin, & Akturk, 2014). The model is comprised of three basic components: technology, content, and knowledge (Celik et al., 2014). The relationship among these components is an important element in the effective integration of technological devices along with the use of appropriate teaching strategies (Celik et al., 2014; Koh, Woo, & Lim, 2013; Voogt et al., 2013; Wu, 2013). The TPACK model is important in the era of modern technologies, content and pedagogy (Celik et al., 2014). Using the TPACK model as a reference during the integration of technology can establish the framework on which the implementation of the process of technology integration can take place.

The context that the TPACK model is implemented can determine the anticipated results of its implementation. The implementation of the TPACK model using a seven-criterion lens is one way to measure its impact on the successful integration of technology in the classroom (Cavanagh & Kochler, 2013). The criteria of the lens include content evidence, substantive evidence, structural evidence, generalizability evidence, external evidence, consequential evidence, and interpretability evidence (Cavanagh & Kochler, 2013; Sahin, 2013). Teachers can use this checklist to examine the extensive evidence for all seven criteria used for decision making. It is a reliable and valid instrument to support the implementation of the TPACK model. The instrument was selected to analyze the impact of the TPACK model on the implementation of technology integration.

The TPACK model can serve as a mechanism to assist instructors in improving their delivery of information by instructors is. The success of this implementation is often contingent on the strategies employed by the instructors during their teaching (Kumar & Vigil, 2011). Because the implementation of the TPACK model is based on instructors'

choice of pedagogy, a suitable framework is required to facilitate the use of new technologies by students (Harris & Hofer 2011; Inan & Lowther, 2010; Krauskopf, Zahn, & Hesse, 2012; Kumar & Vigil, 2011; Pamuk, 2012; Polly, Mims, Shepherd, & Inan, 2010). Kumar and Vigil (2011) posited that the TPACK model has initiated a new trend by universities and colleges in their efforts to meet the needs of tech savvy students with the integration of social media tools such as blogs, Facebook, Twitter, podcasts, and Google Apps into the classroom. Consequently, the popularity of the TPACK model has transformed the growth and sustainability of the implementation of successful technology integration in higher education using new technological tools (Pamuk, 2012). From the TPACK perspective, the integration of modern technological tools into the curricula by instructors acts as a catalyst for meaningfully engaging students in quality learning experiences.

Acknowledging that the implementation of the TPACK model can reduce the complexity of technology integration is an important step in technology integration. According to Mouza and Karchmer-Klein (2013), the TPACK model includes alternative ways that classroom artifacts and instructional materials can be combined with strategies for solving common challenges encountered by instructors during the implementation of technology integration. In the model, the context is created for instructors to capture insights and lessons learned by demonstrating their skills in designing, implementing, and evaluating their own technology integration practices (Lui, 2011). The TPACK model transforms pedagogical content knowledge into a platform that offers instructors greater support in their quest to help their students develop mastery of subject matter in the

simplest forms (Brantley-Dias & Ertmer, 2013). The TPACK model is one approach that instructors can implement during their teaching in an effort to manage the process of technology integration more effectively.

Critical Review of the Literature

In the literature review presented in this study, I address three themes that provide clarity about the problem being investigated. These themes are categorizing technology use to analyze benefits of technology integration, analyzing the barriers to technology integration, and examining the developments in technology integration. The themes selected were relevant in providing clarity about the process of technology integration into the classroom at the higher education level. I focused primarily on the integration of technology in higher education. On a few occasions, technology integration at the K-12 level is discussed to broaden the scope of the concept.

Categorizing Technology Use to Analyze Benefits of Technology Integration

The use of technology in the classroom can be grouped into broad categories. The main categories of technology that can be used to create a foundation for technology integration are technology for planning, technology for instructional delivery, and technology as a learning tool (Inam & Lowther, 2010). Proper planning and expert delivery by instructors can establish a foundation to guide the evaluation of technology literacy (Davies, 2011). In the model, Davies (2011) outlined a road map for evaluating technology, which has facilitated the processes of gathering, organizing, analyzing, and reporting of information regarding the use of technology in the classroom. The evolution

of categories and subcategories that provide clarifications to the process of technology integration and creates opportunities for further evaluation of its implementation.

The evaluation of technology integration has provided a way to examine how instructors use technology as a main planning and delivery tool to benefit their students. Analyzing technology integration, with a focus on its evaluation, creates a broader perspective on which planning, delivery, and evaluation of technology integration can be done successfully (Davies, 2011). The categories associated with technology integration could provide more detailed information on the benefits of technology integration to instructors, their students, and other stakeholders. An examination of previous and current research on the benefits of technology integration can be one effective way of evaluating the effects of technology integration on the classroom environment.

The Benefits of Technology Integration to Students

There are several benefits of technology integration for students. In this study, the benefits discussed include student engagement, motivation, and improvement in academic performance, productivity, and class participation. The extent to which the benefits of technology integration has influenced the implementation of technology integration has contributed to the positive outcomes experienced by instructors and their students participating in the process (Buabeng-Andoh, 2012; Davies, Dean, & Ball, 2013; Kopcha, 2012). In-depth examination of different strategies used to achieve these outcomes, such as meaningful engagement, positive motivation, and the achievement of tangible outcomes, are associated with the benefits of successful implementation of technology integration (Kopcha, 2012). There is an expectation, by scholars in the field

of technology integration, that the information ascertained on the benefits of technology integration can guide instructors in their efforts to become more successful in their efforts to inspire student success in the classroom.

Student engagement. The relationship between student engagement and technology use continues to be analyzed by scholars in an effort to provide additional information on the impact of technology integration in the process of teaching and learning. There is a positive association between student engagement and technology use in the classroom (Gunuc & Kuzu, 2015). Supported by the use of campus-class-technology (CCT) theory, Gunuc and Kuzu (2015) highlighted the importance of technology use in the association between campus engagement, class engagement, and successful student outcomes. Gunuc and Kuzu explained that the value given by university students to their university life and their education was dependent on factors such as the time they spend on campus and effective technology integration. Gunuc and Kuzu explained that these factors contributed to improvements in the students' level of academic achievement and positive learning outcomes. The application of a modular approach in the analysis of the relationship between student engagement and technology integration can provide further analysis of the role of students' interest in the process of successful collaborative learning. The provision of the necessary technology resources to facilitate student engagement is critical for technology integration to support a successful instructor-student interaction.

Class environments that create opportunities for students to be involved in hands-on activities are an effective way of encouraging successful student engagement. The

implementation of the 1:1 Laptop Initiative, a national teacher-level survey during 2008 and 2009, demonstrated that technology integration supports student engagement (Gray, Thomas, & Lewis, 2010). The United States Department of Education (2010) published a comprehensive report on teachers' use of educational technology in U.S. public schools. Data collected, analyzed, and reported by the National Center for Education Statistics (2010) on the Laptop Initiative showed that 94% of the K-12 instructors reported that students used the Internet, and 63% of the teachers indicated that students used software for making presentations (Gray et al., 2010). Gray, Thomas, and Lewis explained that 83% of the teachers reported that their students used educational technology during classes, while 36% of their students designed multimedia presentations. These statistics support the implementation of the integration of technology into the curriculum.

Technology integration has an impact on student engagement. Ertmer et al. (2012); Howley, Wood, and Hough (2012); Keengwe, Schnellert, and Mills (2012); Mackinnon and Mackinnon (2013); and Tamim, Bernard, Borokhovski, Abrami, and Schmid (2011) described the relationship between technology integration and student engagement as being important in promoting effective teaching and learning in the classroom. The presentation of technology integration as one of the most effective means of improving student engagement among the current generation of students is of interest to institutions (Gunuc & Kuzu, 2015). Student engagement is evolving as one of main outcomes of successful technology integration that harnesses the use of modern technology tools in an interactive environment to promote student-centered pedagogy by instructors. Instructors are encouraged to design lessons that will empower their students

to become scholars of technology integration who are highly motivated and meaningfully engaged using modern technologies.

Researchers have provided recommendations on for implementing technology in the classroom to improve student academic achievement. Three of the main elements that are considered as critical elements that facilitate student achievement are the provision of additional resources, training opportunities, and strategic decision making (Ertmer et al., 2012; Howley et al., 2011). These critical elements have contributed towards the success of technology integration in harnessing student engagement. It is also anticipated that the resulting impact of a closer examination of the impact of technology integration on student engagement can have a positive impact on student motivation.

Motivation. Exploring the association between technology and motivation is valuable to the analysis of technology integration in the classroom. Technology integration can motivate university students to achieve greater academic gains while they learn course content at their own pace (Davies, Dean, & Ball, 2013). To achieve this outcome, the implementation of technology integration should be characterized by the establishment of a technology culture model by instructors (Chen, 2010). The successful implementation of this model rests on its design within a specific structural context, such as employing a specific model. Huffman and Huffman (2012) presented the technology acceptance model (TAM) as an intervention designed to assess the level of motivation students experience following effective technology integration. The basic components of the TAM, assessing the ease of use and perceived needs, are two motivators which affect students' likelihood of using technology (Cheung & Vogel, 2013). In assessing the

perceived usefulness of technology by college students, institutions have recognized that students who readily identify the benefits of using technology are more motivated to use technology more frequently (Huffman & Huffman, 2012). The process of applying the TAM to inspire motivation among students during the implementation of technology integration can be considered as a timely intervention. The execution of TAM could provide more meaningful information on the association between synthesis motivation and successful technology integration.

Using a modular approach to examine the relationship between motivation and use of technology is proving to be a worthwhile strategy. Based on the design of the integrated model, motivation, constructivist beliefs, and attitudes toward technology integration were identified as critical factors that contributed to the ability of instructors to successfully integrate technology in the classroom (Sang, Valcke, van Brakke, Tondeur, & Zhu, 2011). In contrast, the synthesis qualitative evidence (SQD) model illustrated that instructors were not motivated to participate in technology integration training courses that were heavily theoretical (Tonder et al., 2012). For the best results in ensuring that individuals are motivated to participate in the process in technology integration, a systematic approach with supporting theoretical framework is necessary (Lee & Lehto, 2013). Motivation can be perceived as one important factor that is a driving force behind the meaningful use of technology to achieve quality learning outcomes. Therefore, special attention should be given to the processes involved in the motivation of individuals who are participants in the process of technology integration.

Improvements in students' academic performance. The ability of instructors to use technology integration effectively to facilitate improvements in students' performance has emerged as a major area of interest in the area of teacher training (Chen, 2010; Sung & Hwang, 2013). The shift toward a student-centered learning environment has provided students with authentic learning experiences where collaboration and the development of critical thinking and problem-solving skills create the important link between technology, pedagogy and content (An & Reigeluth, 2011). The magnitude of the impact of the student centered approach on technology integration is testament of a rise in the use of modern instructional strategies during technology integration (Ertmer & Ottenbreit-Leftwich, 2013). This paradigm shift has contributed to improvements in students' academic performance while making the case for the integration of technology into different curricula.

The impact of technology on student achievement has contributed to significant amount of research done in the field of technology integration. Data included in collective studies, case studies, and experimental studies (Cheung & Slavin, 2012, 2013; Davies, Dean, & Ball, 2013) have suggested discrepancies in findings indicating that the implementation of technology integration has always resulted in improvements in student achievement. Scholars have identified a lack of a control group, limited evidence of initial equivalence between the treatment and control group, large pretest differences, or questionable outcomes as methodological problems that could affect the interpretations of the results of these studies (Cheung & Slavin, 2013). A re-examination of the evidence of the impact of technology on learning in general was recommended by the researchers

(Cheung & Slavin, 2012, 2013; Davies, Dean, & Ball, 2013). The results of such investigations could provide greater balance on the subject of the impact of technology integration on student achievement.

Productivity and class participation. The extent to which instructors are able to be productive and maximize the benefits of class participation can be attributed to the use of new technologies, such as multimedia. The multimedia nature of technology integration has created opportunities for students to be focused during their learning and improve their participation in class activities (Ruggiero & Mong, 2013). The interventions of multimedia technologies have contributed to the transformation of the teaching and learning process (Eastman, Iyer, & Eastman, 2011; Ruggiero & Mong, 2013). The use of new technologies, including multimedia, to transform the technology integration process has been a major achievement in the field of education (Adair-Hauck, Willingham-McLain, & Earnest Youngs, 2013). Modern multimedia applications in the classroom, such as PowerPoint, Prezi, Smart boards, web-based programs, and other contemporary tools, have revolutionized pedagogy in colleges and universities. The continuous evolution of these interactive applications has created a platform for students to participate in project based activities, thus collaborating with peers both locally and internationally, and become more creative in their theoretical and practical activities.

Barriers to Technology Integration

In this subsection, barriers to technology integration, their impact, and possible solutions to these barriers will be discussed. Barriers to technology integration can be classified as obstacles that pose significant hindrances to successful implementation of

technology integration in the classroom. The classification of barriers to technology integration into first order, second order, and third order barriers provides a platform on which the impact of these barriers can be analyzed (Chen, 2012; Kim, Kim, Lee, Spector, & DeMeester, 2013; Tsai & Chai, 2012). The first order barriers are external to the instructor and include factors such as hardware and software resources, training, and support (Chen, 2012). Teacher confidence, beliefs, knowledge, and skills that are internal to instructors are known as second order barriers (Tsai & Chai, 2012). Third order barriers are classified as the lack of design thinking by instructors (Tsai & Chai, 2012). Addressing the challenges to overcome these barriers has significant benefits. These benefits include institutions providing the required resources and instructors becoming competent enough to execute technology integration successfully into the curriculum.

Identifying the specific barriers to technology integration could provide answers to approaches employed by instructors during the implementation of technology in the classroom. Ertmer et al. (2012) determined from a survey that the primary barriers affecting the successful integration of technology are the first order barriers. Using a multiple case study approach, the 78 participants responded to Ertmer et al.'s structured interview questions related to insights on their beliefs that supported their practice. The authors of the study recommended that increasing the instructors' knowledge and skills has the potential to encourage the instructors to implement technology integration. The relationship between the instructors' practices and their beliefs contributes significantly to their decisions to use technology in meaningful ways to support their pedagogy (Chen, 2012). Instructors who practiced technology integration in the classroom could benefit

from appreciable experience by carefully analyzing the potential barriers within their local environment. Instructors who are more knowledgeable about the barriers to technology integration are poised to conduct more effective analysis of the impact of the barriers of technology integration on their pedagogy.

The impact of the barriers on instructors' use of technology. Evaluating the barriers to technology integration can be considered as one meaningful intervention instructors can practice as a strategy to build their competencies about technology use. The most common factors influencing instructors to use technology in colleges and universities are access, vision, instructor beliefs, time, and professional development (Bhuasiri et al., 2012; Kopcha, 2012; Roofe & Miller, 2013; Scheneckenberg, 2010; Wachira & Keenge, 2011). Based on the responses of 42 instructors who participated in the 4-year comprehensive school reform program funded by the U.S. Department of Education, barriers to technology integration have contributed to their unsatisfactory experiences while implementing technology integration (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012). The evolution of common barriers to technology integration, such as instructor beliefs and confidence, access, time, and lack of professional development, has made the implementation of the process more challenging to instructors (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012; Margaryan, Littlejohn, & Vojt, 2011; Roofe & Miller, 2013; Wachira & Keenge, 2011). This development has brought into focus the need for institutions to adequately address these barriers in an effort to empower instructors with the necessary tools, knowledge, and experiences to successfully implement technology integration. Once this objective is achieved, instructors can spend

additional time on achieving improvements in students' academic performance and other meaningful learning outcomes.

Although researchers identified the common barriers affecting instructors' use of technology, they suggested that some instructors were unable to substantiate the direct relationship between these barriers and improvements in students' performance. In one study, Howley, Wood, and Hough (2011) determined that the instructor factor is one barrier that affects technology integration, and closer examination of other factors, such as infrastructure, resources, and training, needed to be done in an effort to find solutions to the existing problem. Inconsistencies in the implementation of programs designed to address the slow rate of growth and implementation of technology integration were also cited as a challenge (Kamal, Weerakkody, & Irani, 2011; Schneckenberg, 2010). The body of research associated with the impact of the barriers of technology integration has brought into focus the extensive efforts being made to indemnify meaningful solutions to address these barriers. The findings of this study, and other recent research studies, emphasized the need for greater efforts to tackle this issue in a meaningful way to achieve the successful implementation of technology integration.

Possible Solutions that Can Address the Barriers to Technology Integration

The search for meaningful solutions to successfully address the barriers to technology integration was prominent in the literature reviewed. Researchers identified technological support, financial support, and top management support as critical elements that are required to eliminate the barriers to successful technology integration in higher education (Kamal, Weerakkody, & Irani, 2011; Karaca, Can, & Yildirim, 2013). The

findings showed that instructors responded with higher levels of confidence toward integrating technology when the requisite support was forthcoming, despite the presence of some barriers (Kamal, Weerakkody, & Irani, 2011). This response from the instructors emphasized their commitment to executing successful integration process despite the presence of the barriers (Kamal et al., 2011). A good deal of effort is recommended to be expended into providing the instructors involved in the implementation of technology integration with support to improve and address their competencies in the field.

The extent to which instructors are competent to integrate technology in the curriculum can be a demonstration of their desire to use the different technologies in their teaching. In a study conducted by Garner and Bonds-Raacke (2013), motivation was identified as huge factor commonly linked with instructors' proficiency and their ability to use technology tools competently in the implementation of technology integration in their classrooms. Using the perception of computer and technology (PCT) scale created by Hogarty, Lang, and Kromery (2003), the researchers determined that the comfort levels regarding instructors' use of technology improved when instructors were exposed to adequate amounts of formal training. Furthermore, using case studies, researchers identified improvements in the competencies of instructors in technology use as contributory factors to their efficient management of existing barriers to technology integration (Hsu, 2010; Hutchison, 2012; Hutchison & Reinking, 2011; Inam & Lowther, 2010). The presentation of these findings provided well needed information on the impact of instructors' abilities to overcome the barriers to technology integration. The ability of instructors to demonstrate the competency necessary to achieve successfully technology

integration in spite of the presence of the barriers was also highlighted in the findings. Attempts to eliminate the barriers to technology integration should take into consideration effective strategies that can harness the roles of the instructors in becoming more innovative and committed to the implementation of technology integration in their classrooms.

Considering the implications of the effects of the barriers to technology integration on the development of modern pedagogy, greater efforts are needed by the leaders in higher education to address the issue. The recommended solution for the removal of barriers to technology integration is often seen as a very costly venture, but investment in the solutions has often produced desired results (Cullen & Green, 2011; Donnelly, McGarr, & O'Reilly, 2011; Roofe & Miller, 2013; Ward & Parr, 2010). The need for instructors to be included in decisions regarding the identification of initiatives that can foster investments to produce solutions to the barriers of technology integration is a major recommendation by some researchers (Donnelly, McGarr, & O'Reilly; 2011; Roofe & Miller, 2013). Addressing this shortcoming within higher education could result in a paradigm shift toward more effective implementation of technology integration at this level. The overall mission of removing the barriers to technology integration remains to encourage more instructors to use technology in their teaching. This intervention can be seen as a necessary approach in the quest to broaden the experiences of instructors participating in the process of technology integration. Additional research on the barriers to technology is necessary to harness the instructors' efforts to become more innovative as they embrace more modern approaches to technology integration.

Developments in Technology Integration

In this subsection, developments in technology integration will be discussed. Specific references will be made to the success of technology integration in higher education and emergent trends in technology integration. The unveiling of new technologies in the higher education classroom is fast becoming part of the daily pedagogical activities of colleges and universities (Berrett, Murphy, & Sullivan 2012; Buzzard, Crittenden, Crittenden, & McCarty, 2011). Specifically, it is the integration of these new technologies into teaching that has contributed to the excitement shown by the modern generation of tech savvy students toward their classroom experiences (Robinson & Shebba, 2010). The journey towards the impact of technology integration on the classroom environment has achieved significant benefits, and these achievements can be closely examined. The product of such detailed examination can result in more emphasis being played on new developments in technology integration by institutions.

The success of technology integration in higher education. The impact of technology integration on the development of higher education is worthy of further exploration. Technology integration is now considered as mainstream in the higher education classroom based on its impact on the latest developments in course materials, the delivering and sharing of content, communications, and administrative support (Benson, Saridakis, & Tennakoon, 2014; Dabbagh, & Kitsantas, 2012; Talebian, Mohammadi, & Rezvanfar, 2014). Considering advantages, such as time, place, access, the enhancement of group collaboration, and direct access to many other instructional resources, developments in technology integration have influenced pedagogy in higher

education (Benson, Saridakis, & Tennakoon, 2014). The process of technology integration is poised to have a greater impact on the pedagogy of instructors who are very responsive to the new developments in the field. The advent of continuous research, innovation, and the presence of new technologies have empowered instructors with the necessary tools and strategies required to transform the delivery of content in higher education.

The process of technology integration can be affected by multiple factors. Despite the many advantages of integrating technology into the higher education classroom, ineffective implementation of technology integration, unprepared instructors and students, and disparities in access to the Internet were reported as common factors affecting the process (Benson, Saridakis, & Tennakoon, 2014; Rossing, Miller, Cecil, & Stamper, 2012). The extent to which these challenges are resolved will determine the rate at which technology integration will dominate the higher education classroom. Positive perceptions of instructors and their students toward technology integration is highly dependent on the ability of the leadership in higher education institutions to remove obstacles that negatively affect their teaching and learning experiences (Rossing, Miller, Cecil, & Stamper, 2012). Therefore, a major challenge that could impede the successful implementation of technology integration is the identification of appropriate solutions to the multiple factors affecting the process that confront instructors. It is anticipated that the proposed solutions to the challenges encountered by instructors during the implementation of technology integration could result in the introduction of the latest technologies in the classroom.

Emerging trends in technology in higher education. Digital technologies have provided excellent support for the implementation of technology integration. The evolution of new technologies and diverse platforms have changed the way instructors and their students consume, distribute, and interact with information (Cassidy, Colmenares, Jones, Manolovitz, Shen, & Vieira, 2014; Pegrum, Howitt, & Striepe, 2013; Pegrum, Oakley, & Faulkner, 2013; Rossing, Miller, Cecil, & Stamper, 2012). In their study on the use of digital mobile devices in the classroom, Pegrum, Howitt, and Striepe (2013) discussed the notion that portability, wide connectivity, flexibility, empowerment, and engagement of learners, and active learning experiences support learner-centered pedagogical approaches. Students who were exposed to the digital classroom had experienced personalized and individualized learning simultaneously and pursued learning at their own pace quite easily (Rossing et al., 2012). The digital technologies have fostered collaboration and communication among students and their instructors to understand content, stay connected, and interact in the era of new pedagogies.

The latest digital technologies found in the higher education classroom include instant messaging, smartphones, e-readers, social networking, real simple syndication (RSS) feeds, learning management systems (LMS), podcasts, tablets, (Herro, Kiger, & Owens, 2013). In recent developments, instructors and students have benefitted from access to a wealth of applications such as games, quizzes, audio, and visual display of malleable content based on the characteristics of smart technologies in the classroom (Cassidy et al., 2014). A plethora of smart technologies have been integrated with digital technologies to provide support for a variety of pedagogical styles, facilitate institutive

learning, provide access to high-quality learning resources, and create standardized learning platforms (Herro et al., 2013). The presence of these new technologies has led to a revolution in the delivery of instruction where instructors are forced to become more creative and innovative during the implementation of technology integration. A platform is now created for instructors in higher education to maximize the opportunities to engage the tech savvy generation in tangible interactive experiences while integrating technology in their lessons (Walling, 2012). Therefore, the students in higher education are considered the beneficiaries of cutting-edge technologies poised to make their learning experiences more exciting and engaging. These students are the beneficiaries of unlimited access to educational resources, more interactive instruction, and increased opportunities to collaborate globally with their colleagues.

The unprecedented use of technology in the classroom has resulted in the emergence of problems associated with the implementation of technology integration. These problems have also posed pedagogical challenges to the instructors. Some of the common problems encountered by instructors while integrating technology include connectivity issues, device limitations, and distractions demonstrated by students when using technology during instruction (Gikas & Grant, 2013; Pegrum, Howitt, & Striepe, 2013; Rossing, et al., 2012). While scholars of the modern era have challenged the notion that the implementation of technology integration is a smooth process that has produced desired results, the problems encountered by instructors cannot be left unnoticed.

Financial challenges remain one of the major challenges faced by developing countries as they seek to embrace the integration of new technologies in the higher education curriculum (Gikas & Grant, 2013; Pegrum, Howitt, & Striepe, 2013; Roofe & Miller, 2013; Ward & Parr, 2010). The unveiling of cheaper technology tools and applications, and the expansion of open education resources (OERs) have provided hope for poorer countries to implement the integration of modern technologies in the curriculum (Rhoads, Berdan, & Toven-Lindsey, 2013). The new focus on the use of OERs in the classroom forms part of the ongoing developments in technology integration that could assist developing countries in their efforts to broaden the implementation of the process in higher education. The constant emergence of new approaches associated with technology integration has contributed to the dynamic developments occurring in the field. The evolution of the flipped classroom and blended learning have emerged as viable pedagogical approaches that can be implemented in higher education as alternatives to the digital classroom (Davies, 2011). The flipped classroom provides opportunities for multimedia lectures to be recorded for students' viewing and access at their own pace as out-of-class activities (Davies, 2011). Blended learning has allowed students to receive a combination of face-to-face instruction in class and the chance to complete activities outside of class through a range of technological resources (Davies, Dean, & Ball, 2013; O'Flaherty & Phillips, 2015). The new paradigm has allowed instructors to deliver cost effective and student centered instruction, which offer students dynamic and innovative learning opportunities. The development of communication and collaborative skills, high order cognitive skills, empowerment, and independent learning

are benefits that can influence higher education institutions in developing countries to adopt the flipped classroom and blended learning (Hwang, Lai, & Wang, 2015). Despite the challenges encountered by stakeholders engaged in the process of technology, research and development has bought into focus the benefits of new approaches and structures associated with its implementation.

The process of technology integration has been subjected to continuous evaluation to determine the most effective approaches required to achieve its successful implementation. The many possible challenges encountered during technology integration have highlighted the complexity of the process, but despite that complexity, technology integration has transformed pedagogy in higher education (Karaca, Can, & Yildirim, 2013). The literature reviewed has brought into focus the different strategies that colleges and universities can employ in an effort to achieve successful technology integration. Many studies have shown that achieving this objective has not been very easy and has required a strategic approach that can harness all the supporting mechanisms.

Implications

Based on the findings from this study, I hoped to develop a professional development program to train instructors at the participating university to integrate technology into their instruction. Efforts to encourage instructors to integrate technology into their curricula require sustained interventions focused on pedagogically sound technology use, the use of technology to personalize instruction, and the recognition of the benefits of technology-enabled assessment (Davies, 2011). The purpose of this project then was to increase the use of technology among all the instructors—an objective

that has not been achieved by most higher education institutions (Ertmer & Ottenbreit-Leftwich, 2010). I proposed this project study could have a significant impact on the transformation of the pedagogical skills of instructors and pre-service instructors in their quest to successfully integrate technology into their curricula. I expect my professional development training program to foster innovation, creativity, and diversity in the use of technology in the classroom by instructors.

Summary

The limited technology integration by instructors in higher education has become a major concern among educational leaders who continue to search for strategies to address this challenge. The focus of this project study was to explore how instructors at the higher education institution selected are integrating technology into their curricula. The problem to be investigated was the extent to which college instructors were integrating technology in their daily classroom practice. The leadership of the selected institution expressed concerns about the readiness of the instructors to integrate technology based on the results of a survey conducted and the analysis of student evaluation following the implementation of the training program. The research questions that guided the process of data collection for the study were focused on how a group of college instructors described, demonstrated, and documented the integration of technology into the classroom.

This section presented the literature review for the study in two sections: The conceptual framework and a critical review of current studies conducted relative to the central phenomenon of technology integration. The major topics of this literature review

were the benefits of technology integration, barriers to technology integration, and developments in technology integration. In the next section, Section 2, I discuss in detail the methodology of the project study, including the qualitative design, participants in the study, data collection strategy and procedures, and data analysis. In Section 3, I present the project for the study, while Section 4 features my reflections on and my conclusion to the study.

Section 2: The Methodology

Research Design and Approach

Introduction

I determined the systematic procedures required to analyze and interpret the data collected during the study based on my selected research design. Research designs are described as procedures applied during data collection, data analysis, and report writing (Creswell, 2012). In Section 2 of this project study, I provide details of these processes along with the justification for the research design and approach used to address the local problem. Answers to the research questions to determine how the college instructors described, demonstrated, and documented the process of technology integration are also provided in this section. In order to gather these answers, I used a qualitative research approach and a case study research design (Creswell, 2012). I chose this design so that I could analyze the data in a meaningful way and address the research questions.

In addition to outlining and justifying the research design, I describe the local setting and the ethical standards that governed the access and protection of the participants. A detailed description of the data collection and data analysis procedures applied during the study is also presented in this section. This analysis led to the answers of the research questions, supported by quotations from the participants' responses. The section concludes with a presentation of the findings of the study. The basis of these findings, which provided clarity to the underlying meaning of the data, was the themes that emerged from the analysis of the data. Finally, I outline the procedures used to maintain research quality.

Qualitative Research Design and Approach

To answer the research questions posed, I employed a qualitative case study methodology. According to Merriam (2009), a case study is considered as an empirical inquiry in which the researcher investigates a contemporary phenomenon, such as teachers' beliefs and instructional practices, and has features such as being descriptive, particularistic, and heuristic. An intrinsic case study approach was employed in this project to better understand the case (Stake, 1995). The intrinsic case study provided an opportunity to study a group where the case itself was the primary interest of the study (Stake, 1995). This approach provided a framework to facilitate an understanding of the phenomenon, as it allowed the posing and answering of the research questions.

The choice of the case study design was determined by a number of factors associated with the project study. The factors included practicality; the location of the data source; ethical issues, such as interviewing my colleagues, data handling, and record keeping issues that might have arisen; and the context of investigating a contemporary phenomenon in a real-life context (Bogdan & Biklen, 2007; Merriam, 2009). The choice of the case study design was based on my ability to facilitate the collection of multiple forms of data to increase the credibility of these data through triangulation of the descriptions and interpretations (Creswell, 2012; Stake, 1995). The grounded theory design was not selected because it is used when the researcher wishes to develop a broad theory or explanation in a process (Creswell, 2012). The grounded theory design would not provide the opportunity to focus on the events of technology integration by instructors. Also, historical, ethnographic, and phenomenological approaches were

rejected based on the inappropriateness of these designs to respond to the research question and the extended time required to conduct these studies (Creswell, 2012). The case study design provided the appropriate context within which the problem could be analyzed and the findings presented as the basis of a project aimed at providing a solution to challenges facing participants when integrating technology into their classrooms.

Participants

The participants of the study were instructors involved in the process of integrating technology into their curricula. A total of 13 participants in the faculty of humanities and liberal arts at the participating college were purposefully selected to participate in the study, based on their unique attributes (Merriam, 2009). This sample size was chosen to facilitate redundancy and saturation during the study, meeting the requirements for the development of a community of practice (Stake, 1995). Furthermore, purposeful sampling was used to select the participants in an effort to ensure that their characteristics appeared in the similar proportion that they appeared in the population of participants at CI (Bogdan & Biklen, 2007). Specifically, homogeneous sampling was used because the participants were members of the same department and taught similar subjects (Hatch, 2002). They were from the social sciences department, which consisted of 15 instructors—the largest group of full-time instructors who teach similar subjects and share similar classroom resources at CI. The other departments at CI consisted of an average of 10 full-time instructors; therefore, selecting instructors from these departments would not guarantee participation of at least 10 instructors.

Gaining access to the participants was not a challenge because I had been employed at the research site for the past 13 years, and they were my colleagues. I held discussions with the dean of the faculty of humanities and liberal arts on the procedures to be employed while I was conducting the study, including the selection of participants and collection of data. Then, at a regularly scheduled meeting of the social sciences department, I met with all of the members of the department before they completed the consent forms to inform them about the purpose of the study and their rights to confidentiality. They were assured that during the data collection, analysis process, and report construction process, pseudonyms would be used to protect their identity. Furthermore, they were informed that the name and location of the institution would not be revealed in the report of the study. Of the 15 members of faculty of the social sciences department, only 13 consented to participate in the study.

The 13 participants were invited to an information session at which they were provided with information about the purpose and procedures of the study. Consent forms were distributed to the participants by e-mail, and those persons willing to participate were asked to return the signed consent form by e-mail. The written consent forms presented to them were designed based on the template provided by Walden University. In these forms, I indicated that there would be no repercussions if the instructors decided not to participate in the study. Furthermore, the participants were given guarantees that once they made the decision to participate in the study, they would not be exposed to any harm. I was responsible for the distribution of the e-mails, and the e-mail messages were sent and received on my personal, password-protected computer.

Role of the Researcher

My role in the project study was that of the researcher. Although I have been a lecturer in the department of science and technology at the participating college for the past 13 years, I have never performed any supervisory role over the participants' duties; therefore, my role and relationship with them should not have negatively affected the objectivity of the data analysis process. However, as a member of the faculty of science and technology, I was aware of the possible impact of my presence on the interviews and observations. Therefore, I made every effort to reduce any obvious impact on the setting during the study (Hatch, 2002). It was necessary for me to state my position relative to the interview as a researcher to the participants, a role clearly understood by the participants. Also, to minimize the level of distraction that could arise, I did not participate in the classroom activities. Moreover, I occupied a position at the back of the classroom during the observations and recorded the activities as observed, taking down my own thoughts and reflections in my reflective journal. To further improve the trustworthiness of my data collection procedures, I took into consideration my biases as an instructor of instructional technology at CI.

As a researcher, I began this study with favorable views about the impact of technology integration on teaching. My personal biases might have affected how some of the participants responded to the interview questions, based on the views I had shared on technology integration. There was also a possibility that because the participants were aware of my beliefs on technology integration, my personal biases could add to my own partiality toward those beliefs while conducting the interviews. Moreover, although I had

explained to the participants that their responses would not be viewed in any context other than to determine participants' integration of technology into their curricula, some interviewees might not have answered the questions truthfully.

Data Collection

The methods of data collection for the project study included interviews, observations, and documentation. The data collection methods helped to answer the stated research questions (Creswell, 2012). According to Merriam (2009), interviews, observation, and documentation are the primary methods of data collection used in qualitative research. These data collection methods were chosen because they were in alignment with the conceptual framework, the problem, and the research questions of my study.

The Walden University Institutional Review Board (IRB) and the institution where the data were collected required me to gain written permission to conduct the study. Once I received the relevant Walden IRB approval, I presented the vice president of academic affairs at CI with the written correspondence, which included the request for permission to conduct the study, the required time to conduct the interviews and observations, and information related to how the data collected would be used. Included in this correspondence were additional details of how the proposed study site would benefit from the study and the assurances related to participant confidentiality. I further informed the vice president that data collection was projected to be completed in 4 weeks and would not disrupt the day-to-day instructional activities of the institution. The vice president subsequently granted the approval. Following the receipt of Walden's IRB

approval (Approval # 07-08-15-0350435) and the consent from the research site to conduct the study, I invited the selected participants to participate in the study. The data collection lasted from July 6, 2015 to July 31, 2015.

I began conducting the interviews once the schedule for the interviews was confirmed with the participants. The interviews were conducted during lunch intervals and at the end of classes. All interviews, except one, were recorded using an audio recorder. One of the participants refused to be recorded, resulting in detailed notes being taken during that interview. The participant refused to be recorded on because he was uncomfortable with the activity.

The data collected for the study were kept on my personal, password-protected computer and an external hard drive. The information provided by the participants was kept confidential and maintained using a system of numbers (0001, 0002, 0003, etc.). A transcription service was engaged to transcribe the interviews, and the company signed a confidentiality agreement. All documents, including the signed consent forms, interview transcripts, and other paper materials related to the study have been housed in a locked cabinet at my home and will remain so for a period of 5 years. They will be deleted at the end of this period in an effort to prevent any uncontrolled access. These security measures were instituted to protect the privacy of the participants and their data. Furthermore, I enforced specific safeguards, including the enforcement of the IRB of Walden University guidelines for user access to the data.

Interviews

During the interviews, the participants provided detailed descriptions of data related to their use of technology. In the interviews, I explored participants' experiences and interpretations to uncover the meaning structures related to the problem of the study (Hatch, 2002). The face-to-face interviews of the participants were used primarily to answer the research question of how college instructors described the integration of technology into their classrooms. I conducted one-to-one, audio-recorded interviews of each participant. The interviews were conducted at a mutually agreed upon time and in the project office conference room, outside of the instruction time of the participants.

The interview protocol (see Appendix B) was designed to provide consistency in the responses from each participant. The interview protocol contained nine semi structured questions. The first four interview questions were related to the participants' personal view of technology integration, while the other five targeted the actual integration of technology into the classroom by the instructors. All participants were interviewed following the completion of the observation of classes.

There are several strengths and weaknesses of interviews as a method of collecting data. Advantages of conducting interviews include the ability of participants to seek clarification of questions and the interviewer's ability to probe the participants' responses and seek further clarification (Doody & Noonan, 2013). Factors such as the presence of the researcher and the potential for malfunctioning of the equipment can affect the response of the participants during the interviews (Creswell, 2012). To address the potential malfunctioning of the audio tape recorder used during the interviews, I took

copious notes during each interview. At the beginning of each interview, I highlighted the purpose of the interview, measures to maintain confidentiality, and the voluntary participation of the interviewees with the interviewee.

The interviews with the participants were conducted within a period of 2 weeks for a duration of 30 to 40 minutes in the conference room of the project office at the institution. Of the 13 interviews, two took less than 20 minutes, eight took more than 20 minutes, and the other three took over 30 minutes. The interviews were transcribed by the designated transcription service. Following the transcription of the interviews, I took the opportunity to edit the transcriptions to improve their quality.

Observations

An additional method of data collection used in the study was observations. The aim of conducting observations of the participants' teaching was to understand the phenomenon being studied as demonstrated by the participants in the classroom setting (Hatch, 2002). The observations were used to explore how the participants integrated technology into their classrooms, as well as to verify and provide a deeper understanding of the meaning of the information gathered from the interviews of the participants (Creswell, 2012). I assumed the role of a complete observer during the observations.

Each participant was observed teaching one 3-hour lesson. Seven instructors were observed teaching in their regular classrooms, four in special lecture rooms, and two in computer laboratories. A total of five lessons were observed between 8:00 a.m. and 11:00 a.m., five between 1:00 p.m. and 4:00 p.m., and three between 5:00 p.m. and 8:00 p.m.

All 13 lessons were observed between Monday, July 6, 2015 and Thursday, July 16, 2015.

Two forms of data that accompanied the observations were an observation protocol and field notes. An observation protocol (see Appendix C) was used to record the events during the observations. The observation protocol recorded the frequency with which the participants being observed used different technology application tools (presentation software, word processing applications, Wikis, Gmail, Webquest, Google Maps, Facebook, and Skype) during their teaching. The field notes were records of the participants' quotes during the observations (Creswell, 2012). Special efforts were made to record raw field notes of what was seen and heard during the teaching activities to provide accurate descriptions. In keeping with Merriam's (2009) recommendation that the process should be systematic to avoid bias, I noted my reflections on what was observed in my reflective journal at the end of each observation.

An efficient structuring of the observation episodes provided rich data that were used with those gathered from the interviews and documents to facilitate a better understanding of the phenomenon; however, this method has been found to be both advantageous and disadvantageous. The method is advantageous as observations present the opportunity to record information as it occurs in a given setting and to study the actual behavior of participants (Creswell, 2012). In addition, observations conducted at different times have been considered as an effective resource for achieving triangulation during data collection (Merriam, 2009). In spite of these advantages, observations can be negatively impacted by deception as the participants may display staged behaviors.

However, based on my familiarity with the participants and the observations occurring in their natural classrooms, I felt confident that the staging of behaviors would not be a major problem.

Documents

The third source of data for this project was documents. The latter provided valuable information that assisted in the understanding of the central phenomenon of the study (Creswell, 2012). The research question associated with documentation concerned how the participants documented the integration of technology into their classrooms. The documents examined during the study were the participants' plans, the strategic plan for the institution, and the minutes of meetings held by the social sciences department. The vice president of academic affairs was contacted to gain permission to access the strategic plans of the institution and the head of the social sciences department for all the records of the departmental meetings. I encountered no difficulties in being provided access to the records of these plans. These documents provided insights into the system that facilitated the extent to which the participants used and documented technology integration.

The institution's strategic plan was used as a source of documentation because no strategic plan existed in the different departments. The institution's strategic plan was used as the benchmark in referring to the strategic direction of the social sciences department in relations to technology integration. The documents were examined for a deeper understanding of the underlying meaning of the observation and interview data.

The analysis of the documents corroborated the data provided by the observations and interviews.

Instructors were not required to submit instructional plans at this institution, but they were expected to plan their lessons. Despite the fact that the participants did not provide any official, written plans for the lessons observed, I was able to examine summary participant notes written for the lessons. For each session I observed, the participants established the objectives of the lesson at the beginning of the class. .

Data Analysis

The two methods of data analysis used were typological and inductive. Typological analysis involves dividing the data collected into categories based on predetermined typologies (Hatch, 2002). Inductive analysis is a search for patterns of meaning in data so that general statements can be determined from such data (Hatch, 2002). The questions on the interview protocol (see Appendix B) were derived from Research Question 1. Following the transcription of the interviews, the participants were given copies of the written transcripts to verify the contents. Two participants returned the transcriptions with minor adjustments, while the others responded that they were satisfied with the transcriptions of the interviews as being complete and accurate.

I exercised special care to avoid researcher bias by ensuring that my own opinions and feelings did not impact the analysis of all the data. In carrying out this process, I did not allow my own reflections to influence the information presented by the participants in the interviews. Following the examination of the interview transcripts, I consulted the field notes in my reflective journal with regard to the observation data gathered. I

employed a cross-referencing exercise for both the interviews and the observations to determine the similarities and differences associated with the literature review findings. The documents were used to validate the data from the interviews and observations and to gain a deeper understanding of the underlying meaning of these data in reference to the participants' use of technology integration.

Typological Analysis

Typological analysis was done using Hatch's (2002) model to make the categorizing of data easier. The main typologies were selected from the three levels identified on the continuum for understanding technological literacy and the main components of the TPACK model outlined in the conceptual framework. The three main typologies were awareness, praxis (training), and phronesis (practical competence and practical wisdom), and they are considered as characteristics for evaluating technology integration (Davies, 2011). The other topologies were from the TPACK model and included technological knowledge, pedagogical knowledge, and content knowledge (Berrett, Murphy, & Sullivan, 2012). These typologies were selected based on the need to assess the level of the participants' capabilities to integrate technology into their teaching. The typologies provided a framework on which the main themes could be established and provided the basis for generating the minor themes.

The data collected from each interview were coded to develop themes. A total of 10 major themes were developed as statements from the codes extracted from all the transcriptions. The themes related to the first research question were the impact of technology integration in teaching, students' abilities to integrate technology, tools and

applications used by students, and the philosophy of instructors. There were two themes associated with Research Question 2, technology facilities and technical support and methodologies used by participants. The themes related to Research Question 3 were training and preparation of instructors, challenges faced by instructors and students, tools and applications used by students, and instructors' perceptions of technology integration.

All the themes associated with Research Question 1 were supported by interviews, observations, and documents, except the philosophy of participants. The latter was not supported by documentation. Both themes related to Research Question 2 were supported by all three methods of data collection. In the case of Research Question 3, all themes, excepting tools and applications used by students, were not supported by documents. All the themes were supported by interviews and observations.

The typologies generated from Research Question 1 were awareness and technological knowledge. Awareness was defined by the user acquaintances with new technologies, while technological knowledge was understood as knowledge of technology tools. The four main themes associated with Research Question 1 were aligned with these two typologies. The alignment of both typologies contributed to detailed analysis to sufficiently answer research question one.

The awareness of the participants was reflected in how they described the impact of technology integration on their teaching, and how their students integrated technology. The participants described their technological knowledge during technology integration practices based on the technological tools they used. The philosophy of the participants was a description of the rationale they gave for integrating technology in their curricula.

The awareness of the participants was a function of their basic competencies demonstrated during technology integration.

Both main themes generated from the typologies were supported by interviews, observations, and documents. Technology facilities and technology support, and methodologies used by the participants were the main themes related to the typologies. Praxis and pedagogical were the two typologies associated with Research Question 2. Praxis is defined as the extent to which the participants explored a variety of applications. The pedagogical knowledge of the participants was a demonstration of the teaching methods they applied during technology integration (Davies, 2011). During the process of technology integration, the information gleaned from praxis was used to guide the selection of typologies related to phronesis and content knowledge.

Phronesis and content knowledge were the two typologies generated from Research Question 3. Phronesis is a description of the technology capabilities of the participants (Davies, 2011). The content knowledge was a description of the participants' knowledge of their subject matter. The main themes associated with phronesis and content were training and preparation of the participants, challenges faced by participants and their students, tools and applications used by students, and participants' perceptions of technology integration.

All the main themes used in the analysis were derived from interviews, observations. However, the theme representing the participants' perceptions of technology integration was the only main theme supported by documentation. All the main themes generated from the typologies were supported by both interviews and

observations. These two methods were instrumental in supporting the analysis of the participants' use of technology in the classroom.

The utility of technology integration and the supervision of technology integration were the discrepant cases identified during the data analysis. Evidence of both cases were derived from both interviews and observations. There was no evidence of the discrepant cases in the documents. Throughout the data analysis, the utility of technology integration by the participants became evident based on how these participants used the technology tools available to them. The impact of the supervision of technology on the process of technology integration was a concern expressed by many participants of the study.

Following the categorization of the main themes, minor themes were determined from these main themes. Three minor themes were technology integration promoted research, technology integration promotes hands-on activities, and technology integration transforms students' learning. In the case of the main theme, students' abilities to integrate technology, three minor themes were generated. These minor themes were students were very tech savvy, students used technology to develop, design, and created their own learning materials; and technology integration contributed to improvements in students' performances.

The two minor themes generated from the main theme were tools and applications used by the participants. These minor themes were PowerPoint, videos, pictures, and some web-based applications were the common tools used by participants; a few participants used online teaching; and the smart board. Three minor themes were extracted for the main theme philosophy of participants. These themes were the

philosophy of participants is aligned to the extent to which they integrated technology, some participants' philosophy influenced their colleagues, and the philosophy of participants influenced the use of technology by their students.

Three minor themes were extracted from the main theme technology facilities and technical support. These included the shortage of specialized facilities, inconsistency in technical support provided, and how technical support contributed to the extent to which some participants integrate technology. In the case of the main theme, methodologies used by participants, three minor themes were generated from the data. These were identified as participants used student-centered approaches, grouping was a common collaborative technique used by participants, and technology integration changed the participants' method of delivery.

There were two minor themes extracted from the main theme training and preparation of instructors. These minor themes were the interest of participants in further training, and the need for the institution to institutionalize training in technology integration. Three minor themes were derived from the main themes challenges faced by participants. These include lack of resources, poor Internet connectivity, and shortage of laboratory space.

The three minor themes generated from the main theme tools and applications used by students. These minor themes were web applications and PowerPoint were the most common tools used by the students, students used their smart devices regularly in classes, and students had access to the electronic library. The two minor themes extracted from the main theme participants' perceptions of technology integration were technology

integration can be time-consuming, and technology is not a panacea. Table 3 shows a detailed description of the major themes, minor themes, and discrepant cases that were extracted from the data.

Table 3

Major Themes, Minor Themes, and Discrepant Cases

Major Themes	Minor Themes	Discrepant Cases
Impact of technology integration on teaching	Technology integration improved academic performance	The utility of technology integration
	Technology integration promoted interest and engagement	Supervision of technology integration
Students' abilities to integrate technology	Students' were tech savvy but they also misused technology	
Tools and applications used by participants	PowerPoint, videos and websites are the most common tools used by participants	
Philosophy of participants	Philosophy determined how participants used technology	
Technology facilities and technical support	There is a shortage of specialized facilities	
	Technical support encouraged participants to technology integration	
Methodologies used by participants	Participants used student-centered approaches	
Training and preparation of participants	Participants requested additional training in technology integration	
Challenges faced by instructors and students	Poor Internet connectivity, lack of resources and insufficient laboratory space were common challenges faced by participants	
Tools and applications used by students.	Web applications, PowerPoint, and Smartphones were common tools used by students	
Participants' perceptions of technology integration	Technology integration had its advantages and disadvantages	

Inductive Analysis

The application of the processes of inductive analysis is a description of the detailed analysis of the data collected during the study. This approach to data analysis facilitated an examination of specifics within the data and allowed the presentation of such information as general explanatory statements (Hatch, 2002). During the process, the interview transcripts were prepared in a common format, separating the interview questions from the interviewees' responses using Microsoft Word. All the transcripts were formatted similarly using the same font size, margins, and so on. The transcripts were then saved to the external hard drive before they were printed.

I repeatedly read the transcripts in details until I became familiar with the contents. A pathway was established were the reading of the transcripts resulted in the identification of the different themes found in each transcript. Initially, I identified and defined the different themes from common phrases occurring in the different transcripts. During the next step, I placed the themes into different categories that emerged from the transcriptions. The emerging themes were assigned a code to make sense of the data, and they provided a context in which the categories were organized. The choice of categories was based on the frequency of the occurrence of common information shared by the participants. The revision of the codes continued with the combination of categories until a smaller number of categories were selected. This was done in order to prevent overlapping and redundancy among the categories.

Once I identified the typologies based on the research questions, I identified the main themes. Linking the main theme with the meaning of the specific typology,

determined the relationships between the main themes. Subsequently, patterns supported by data from the interviews, and from the observations were presented. The supporting data was a description of the evidence presented by the participants. A summary of the inductive analysis process is captured in Table 3, which shows the relationships between the research questions, the typologies from the research questions, and the main themes generated from the typologies.

The process of composing the data together to make some meaning of its interpretation, was dependent on the application of the process of triangulation. The triangulation activities involved the corroborating of evidence from different types or methods of data collection in an effort to validate the findings (Creswell, 2012). The use of interviews, observations and documentation as methods for collecting data was, therefore, one way of establishing the validity of the research findings. This method allowed the corroboration of data collected from the interviews, observation, and documentation (strategic plans, instructors' plans, and notes from staff meetings). The observations were conducted to make comparisons with the information provided by the participants in the interviews. The contents of the participants' plan and meeting notes presented a comparison of data collected from the interviews and observations. The section of the institution's strategic plan that provided a description of technology integration within the institution was used as a reference to compare the practices of the participants in relation to the targets established by the institution.

I applied specific procedures to strengthen the quality of the findings of the study. These procedures included member checking, triangulation, and peer debriefing. The

participants validated the accuracy and completeness of the findings by reviewing the draft findings sent to them by e-mail. Each participant received a copy of the transcription of the interview to validate the information (see Appendix F for sample of transcript). I used the feedback provided by the participants to make corrections to those transcripts that had errors. Consequently, this form of member checking provided evidence of the quality of the findings (Creswell, 2012). The different efforts applied to achieve accuracy and credibility of the findings of the study contributed to the value of the data analysis.

One of my colleagues, currently completing her doctoral studies, served as a peer reviewer. She reviewed some of the de-identified raw data as part of the assessment to determine whether the findings were plausible. We met on three occasions to examine the data collected from the interviews and observations. I provided clarification to the peer debriefer on a few possible assumptions written in the notes taken from two observations. She suggested that I should rewrote a few sentences to correct statements that could be deemed as assumptions.

The identification of discrepant cases was part of the process of data analysis. I included data that could not fit easily within the main themes as discrepant cases. According to Yilmaz (2013), the inclusion of the discrepant cases contributed to a broader interpretation of the findings and validation of these findings. The two discrepant cases—the utility of technology integration and supervision of technology integration—expanded the scope of the data analysis. They provided additional information that supported the extent to which the participants integrated technology into their curricula.

Limitations

Methodological factors and research qualifications are considered common limitations to research studies. The methodology of case studies do contribute the conclusions from these studies are not intended to be predictive or generalizable to a larger population. Despite this limitation, special efforts were taken to provide numerous examples of data from the interviews in the data analysis in Section 2 as well as archival data in Appendix B, providing readers access to thick, rich data from this qualitative study. This project study was therefore limited by, (a) the non-inclusion of students as research participants because minors are a protected population, (b) the restriction of the selection of participants of the study from one department at the institution, which consists of 18 departments, (c) and the limitation of the instances of observation of the participants classes to one observation due to time constraints. Time was a major limitation to the research study. An ethnographic or grounded theory study would provide opportunities for a longer period of time to be dedicated to this study allowing for the presentation of more in-depth findings.

A major challenge facing the researcher was that human researchers conducting research on human participants cannot be free from bias. Despite the efforts taken by the researcher to reduce research bias, it was very difficult to reduce such bias. Additionally, the research was further limited by the existence of one novice researcher, increasing the subjectivity of the research. The engagement of an experienced team of peer debriefers could have added more detailed findings to the study. Finally, the possibility of errors due

to judgement and memory was a major possibility while the research was being conducted.

Data Analysis Results

The integration of technology into the curricula to complement the different methods of pedagogy remains one way of meaningfully engaging students in the classroom. The participants in this study were not integrating technology sufficiently into the different areas of their curricula. The research questions sought to determine how they described technology integration, how they demonstrated the process, and how they documented technology integration. Of the 15 instructors in the Social Sciences department, 13 agreed to participate in the research. During the interviews, they were asked questions related to how they practiced technology integration in their classrooms. These questions included how technology integration influenced their philosophy, the teaching strategies they employed during technology integration, and the common tools they used.

Based on the analysis of the data from the interviews, questionnaires, and documents, a number of main themes emerged. The main themes that I identified were the impact of technology integration on teaching students' abilities to integrate technology tools and applications used by instructors, philosophy of instructors, technology facilities and technical support. Other main themes included methodologies used by instructors, training and preparation of instructors, challenges faced by instructors and students, tools and applications used by students, and instructors' perceptions of technology integration. I recognized that these themes had been presented

in similar research studies done on technology integration in the classroom. I organized these themes to show the relationships between the main themes, the typologies, and the research questions organization as illustrated in Table 4. Table 4 shows the main themes generated from each research question and the instrument associated with the collection of data related to each theme.

Table 4

Research Questions, Themes, and Data Sources That Support Themes

Research Questions	Data Themes	Interviews	Observations	Documents
How do college instructors at CI describe the integration of technology into their classrooms?	Impact of technology integration on teaching	Yes	Yes	Yes
	Students' abilities to integrate technology	Yes	Yes	Yes
	Tools and applications used by participants	Yes	Yes	Yes
	Philosophy of participants	Yes	Yes	No
How do college instructors at CI demonstrate, the integration of technology into their classrooms?	Technology facilities and technical support	Yes	Yes	Yes
	Methodologies used by participants	Yes	Yes	Yes
		Yes	Yes	No
How do college instructors at CI document the integration of technology into their classrooms?	Training and preparation of participants	Yes	Yes	No
	Challenges faced by participants and students	Yes	Yes	Yes
	Tools and applications used by students.	Yes	Yes	No
	Participants' perceptions of technology integration	Yes	Yes	No
Discrepant Cases	The utility of technology integration	Yes	Yes	No
	Supervision of technology integration			

Themes Identified in Data

The Impact of Technology on Teaching

The first major theme generated from the data analysis was the impact of technology on teaching, which provided insights into the participants' use of technology integration throughout their teaching. During the interviews, I asked the participants to describe their feelings about the impact of technology on teaching and in their subject areas. They mentioned the ability of technology integration to make learning more interesting, the ways it has changed how their subjects were being taught, and the role technology played in encouraging students to become critical thinkers. For example, Participant 0010 responded:

> My perspective on technology in teaching is that it is a necessity based on the hands-on experiences provided during its implementation. Technology integration creates an opportunity for students to become critical thinkers who are able to analyze information and use this information creatively.

The impact of technology on teaching was consistent with the responses shared by other participants. Here is one such response by Participant 0005:

> In the teaching of geography, technology has had a marked impact on the subject to the extent that we have changed the way the subject is taught and understood. Some information that was understood to be facts have been updated because of modern technology. For example, until recently, it was thought that the Black River was the longest river in Jamaica. However, due to technology such as Global Positioning Service (GPS) mapping, the longest river is actually the Rio

Minho. This information shows that technology has a significant impact on knowledge, truth and facts.

The views shared by the participants were consistent with the finding that technology integration have created a positive impact on students' learning experiences. These views were significant in the context that technology integration can assist instructors to engage students successfully in the classroom.

When the participants were asked about the critical roles that technology integration had been playing in their teaching, they identified four specific critical roles. The interest demonstrated by students, their creativity, communication, and research skills were critical roles that were impacted by their exposure to technology integration. Most participants articulated that technology played a significant role in their teaching although this role had changed over time. Participant 0004 stated, "Technology has changed the old approach of the teacher, and the teacher is no longer the only source of information." Participant 0002 declared, "Technology has opened avenues for students to do more research, but they sometimes become distracted and failed to capitalize on the benefits of the technology itself." The roles that technology integration play in fostering a positive learning environment can be considered as an objective that instructors and their students attempt to achieve based on the views of the participants.

Based on the views of at least four participants, the first minor theme was a description of the role that technology played in the improvement of students' academic performance. Participants 0001, 0004, 0008, and 0012 explained that students who used technology effectively benefited as they earned higher grades in specific subjects.

Participant 0012 asserted, “The students actually not only enjoy technology integration, but it shows in their academic performance, and so they really excel at the end of year of end of term exams because the students are enjoying themselves.” Participant 0004 identified other benefits, “Technology provides motivation, and it gives students a greater desire to want to learn because the students are not bored anymore.” Technology was frequently used by participants as a tool to motivate their students to become more interested in the different subject.

The approach taken by the participants during the implementation of technology integration brought different results. Participant 0007 reported, “In my experience, the effects of technology integration on learning has been slow. It is slow because there is a reluctance to change a specific teaching method that I have proven to be reliable over the years. Implementing technology is not simply plug and play that is one of the problems.” Participant 0001 asserted, “Technology integration is time consuming. It's really takes a lot of your time to select from the existing information and find the appropriate objective you require for a particular topic.” However, this was not the case for Participants 0003, 0005, 0009, and 0012 who explained that they encouraged students to use technology, since this practice subsequently broadened students’ knowledge and experiences in the different curricula. Participant 0003 stated:

> There was a student in my class who was very fearful about using technology in the classroom at the beginning of the semester. However, during her teaching practice experience, she reported that her students were very excited about using the technology. According to her, she was very worried at the beginning, but as

> she progressed during the practice her confidence grew and even the teachers congratulated her. Following the end of the teaching practice, she was recalled to do additional teaching. Initially, this student resisted using technology, but in the end she saw the benefits of technology integration.

A similar view was shared by Participant 0005, who expressed satisfaction with his students' progress in their use of technology. He identified the high level of responsibility exercised by some students when they were using technology tools and applications. Participant 0006 further explained, "We can simply send the students the information as uploads via email and they're able to access the information." Participant 0012 responded:

> I also allowed the students to complete activities that involved using their own technology skills to create videos and documentaries. They created lessons and shared their technology presentations during classes. The presentations generated a lot of excitement, and I liked that, it was fun. This is something that the students do every day and they are now using the technology for a purpose that enhances their learning.

The distinct differences in experiences by the participants, pointed to the variation in the results of the impact of technology integration into the classroom. In responding to how the students benefited from technology integration, all participants identified specific benefits based on their teaching experiences.

The second minor theme was the extent to which technology integration provided interest and engagement among students. Participant 0006 emphasized, "The students

benefitted from the high levels of interest, engagement and involvement that the technology provided. They can gain access to reference materials and other information because technology has entertainment value." Participant 0011 reported:

> The students have benefited because they are able to conduct research out of class. It is a pleasure to see the students organize their information and do their presentations in class. This builds their confidence and their presentation skills are developed in the process.

Overall, the participants agreed that technology integration should be included as a part of the students' learning experiences.

Technology integration featured prominently in the institution's 2013 to 2016 strategic plan. Appropriate technology integration was one of the main enablers established to drive the targets for the period. The targets included having adequate technology to support teaching and learning, improving the physical capacity of the technological system, and constantly upgrading the skills of persons using technology. It was an expectation by the management of the institution that departments implement the strategies relating to technology integration based on the resources provided to each department. The implementation of technology integration was a feature on the yearly plan developed by the head of the social sciences department. At the first department meeting held for the academic year 2014 to 2015, the head of department encouraged the participants to use technology in their lessons. The response of the participants indicated that there were serious limitations with the availability of resources, and this reduced their efforts to integrate technology in meaningful ways.

Students' Abilities to Integrate Technology

The second major theme was identified as students' abilities to integrate technology into their curricula. The participants confirmed that the students demonstrated specific competencies while integrating technology. Participants 0001, 0004, and 0007 were quick to point out that their students were more tech savvy than their instructors when it came to technology integration. Participant 0004 asserted, "We all aware that our students are more "tech-savvy" than some of us lecturers." The competency of the students was further evident during the observations, where it was common place for students to be seen integrating modern technology tools into their curricula. During the observation of Participant 0001, students were observed using their smartphones capturing images from the instructor's presentation. Other students were also observed demonstrating the functions of blogs, Webquests, and Google Earth in their class.

The minor theme that supported students' abilities to integrate technology was the students were tech savvy, but they often misused technology. The ability of students to effectively plan their lessons was evidence of their competence to integrate technology. During the presentations by the students in their classes, the students displayed clear evidence of integrating modern technology tools in their lesson plans. These plans demonstrated the use of PowerPoint along with integration of websites, videos and Webquests as their main tools for technology integration. Participant 0008 stated:

> The students utilized Google Earth and do PowerPoint presentations on teaching practice. However, despite the benefits of Google Earth, so students were unable to access the resource because of poor internet access. The students who used the

> technology utilized during the teaching practice received the highest scores. The external examiners for the teaching practice exercise were extremely impressed with the use of technology in the classroom, and how it is related to the objectives of the lessons developed by the students.

Based on the observations of the classes, there was evidence to prove that the students demonstrated the value of applying the principles of technology integration to their teaching as part of their professional training.

In spite of the students' abilities to integrate technology into their classroom, there were instances when some students misused technology. When the participants were asked about the critical roles technology played in their teaching, Participant 0002 expressed a concern:

> The problem I encounter with my students is that when they used the computers, I observe some negative outcomes. These include some students using the computers to do research, evidence of plagiarism, and the cutting and pasting of information directly from the Internet. I have a major challenge with these occurrences.

Participant 0012 acknowledged:

> As I explained earlier, we do a lot of recording of our class sessions and these recordings are replayed for analysis. During these sessions, if students become distracted I engage them in activities that allow them to do some research online, once the Wi-Fi is functioning. The reality though is that the students are naturally attracted to the technology and are constantly using the Internet once it is

> available. They like to be engaged with their electronic devices and quite often they are using technology in their lesson.

In addition, Participant 0010 claimed, "There are ways of even using technology to check the students' work for weaknesses such as plagiarism and I do this quite often." The evidence of students' misuse of technology points to a need for instructors to implement measures that can sufficiently manage the students' distraction.

Tools and Applications Used by Participants

The third major theme identified during data analysis was the tools and applications used by the participants during technology integration. All participants used some form of technology during their teaching. The most common tools identified by participants were PowerPoint, videos, and websites. All participants reported using PowerPoint during technology integration. Participants 0009, 0010, and 0013 identified PowerPoint as their favorite technology tool. According to Participant 0013, "PowerPoint has allowed the incorporation of different media and tools such as tables, graphs, photographs, cartons, you name them. They all can be easily incorporated into the PowerPoint." The participants also reported that the students were very comfortable using technology as a source of stimulating their engagement in research, problem solving and collaboration.

The minor theme that was generated from the main theme, tools and applications used by participants, was the other technology tools commonly used by the participants during technology integration. Eight of the 13 participants reported using web-based tools

in the classroom. The most common web-based tools used by the participants were Google Maps, YouTube, Skype, and Webquests. According Participant 0004:

> I used the search engines every day. I use emails to send instructions and work for the students. Therefore, I find the emails and search engines very useful. PowerPoint is a very effective tool at all times. I love to use videos because an opportunity is created to explore all the topics I teach. I am able to incorporate pictures of different countries, places and many other elements of my lessons.

All the participants identified technology as an integral part of their daily teaching activities.

One of the targets of the institution's strategic plan was to encourage department heads and their instructors to use Information and Communications Technologies (ICTs) to increase offering of online and open university courses and programs by 2016. The institution embarked on the use of the Moodle resource to offer courses online. Participant 0003, 0008, and 0012 mentioned their current involvement in course preparation using Moodle platform. Participant 0003 expressed:

> In recent times, Moodle has become an option to use in the classroom and I am thinking of using the resource in my courses. The institution is now offering instructors an opportunity to use Moodle in our teaching, which allows students to use forums to communicate and receive information. In my department some of my colleagues are actually using the Moodle resources.

The institution recently established a specific department which has the responsibility of implementing the delivery of courses online using Moodle.

There was a concern expressed by Participants 0004 and 0012 about the overuse of PowerPoint by some of their colleagues. Both participants shared the view that there were other tools available for use in technology integration and overusing PowerPoint could demotivate students. Participant 0012 recommended that teachers should be careful "not to be monotonous" with technology. Using technology inappropriately was perceived as one of the difficulties encountered by teachers during technology integration. For example, Participant 0010 stated:

> I am of the view that we should move away from using PowerPoint to present content during teaching. I have observed many teachers preparing slides that lack interactivity and they are of the view that this is using high tech. In my view, it is simply adding information to slides, which is basic technology. I think that this practice equates to standing in front of the students and writing the information on a board.

The overuse of PowerPoint by instructors could be conceptualized as a symptom of lack of training among instructors in the field of technology integration.

All participants reported making considerable progress using technology throughout their careers. Participants 0001, 0004, 0005, and 0009 mentioned that they were very fearful of using technology at the beginning of their teaching careers. Participant 0001 shared, "At first, when I just started, I was highly intimidated by this whole notion of technology. But having gone to Nova University where I was forced into using technology, I realized that the technology is not so intimidating." Similarly, Participant 0004 stated, "My history of using technology began a couple years ago, I was

very timid in terms of using technology." Participant 0009 shared similar experiences, "In my reflections, it was always very frightening using technology. However, as time progressed I acquired a greater appreciation for using technology. It has made my lessons flow much easier and I communicate with my students more effectively." Participant 0007 explained:

> Personally, I am not a lover of technology because I am very old school in my approach, but I have learnt to make some adjustments along the way. At the previous institution I taught some technology tools were available, but you were not forced to use technology, you didn't really have to use it.

The participants shared different experiences on how different tools and applications could be integrated into their teaching.

Philosophy of the Participants

The fourth major theme identified during the data analysis was the philosophy of the participants. When asked how technology integration had influenced their philosophy of teaching, the participants revealed that their philosophy determined the extent to which they used technology in the classroom. Their philosophy was aligned with their views on the strategies they applied during technology integration. For example, Participant 0002 clearly embraced constructivism as the approach during technology. That participant explained, "My classes must be hands-on, they must be practical, they must be student friendly and so on." Participant 0005 identified citizenship education as the heart of his philosophy, where the human becomes a worthwhile citizen who has to use technology

integration. Participants 0007 and 0010 stated that their philosophy had changed over time. The former responded:

> The truth to be told, my philosophy has evolved. Earlier in my teaching, I simply wanted students to learn the material and to learn it well. Technology has allowed for a widening of this scope, so it's not just getting the students to learn the material, but to also understand its purpose. Therefore, it's not just learning for gaining knowledge, it is learning for personal development.

An additional example was provided by the Participant 0010, who stated:

> My philosophy has changed over time; that's just what I believe. In the context of today's development, you change your philosophy along the way, making adjustments to ones' philosophy is very important. Therefore, over time my philosophy has evolved into a concept where I accommodate the students' as customers. The students are the main focus of my teaching and therefore, special efforts should be made to ensure that they are satisfied.

Participant 0001 highlighted the impact of technology on the strategies employed during teaching by stating, "I am from the traditional era where as the teacher you develop the belief that the teacher has all the information and the teacher is the expert. However, technology integration changes that mindset, and helps you to draw on other resources." Participant 0003 reported that the experiences of participants had an impact on their interpretation of how they used technology. The participant referred to creating a philosophy that determined how technology was used based on teachers' experiences using technology.

Six of the 13 participants were of the view that their philosophy influenced their colleagues. The participants identified their abilities to integrate technology as a main source of influence on their colleagues. Participants 0002, 0004, 0006, 0007, and 0011 were unsure if how they used technology influenced their colleagues. These participants shared the view that their philosophy had a greater influence on their students rather than their colleagues. Participant 0002 stated:

> My philosophy has influenced the students I teach. Each of my colleagues has their own style. A lot of times, I do not follow the crowd, likewise I do not expect the crowd to follow me. My colleagues use their own approaches to teaching, some use technology as the only tool during their teaching. As part of daily routine, my students are required to use technology to write reflections on their use of technology for each course I teach.

Participant 0005 shared:

> I would say that earlier my philosophy influenced my colleagues, but recently some of my colleagues have influenced me with their own philosophy in many ways. In my own view, a transition has taken place, my philosophy has influenced others and the opposite is now happening. But I have to admit that people, including my colleagues have influenced me more with their use of technology.

The philosophy of participants can be considered a major factor that can influence instructors to include technology use as an outcome of their students learning experiences.

Technology Facilities and Technical Support

The fifth major theme identified during data analysis was the impact of technology facilities, and technology support on the participants' attempts to integrate technology. The condition of the facilities, and the nature of the technical support were major factors that determined the outcome of technology integration by the participants. All the participants expressed concerns about the condition of the facilities that are available for the instructors to integrate technology with their students. Participant 0006 revealed:

> I operate in a classroom environment which is not equipped with the relevant resources to integrate technology. Enough equipped lecture theaters are not available. There is a need for retrofitted spaces, at least one lecture theatre in each faculty that is equipped with proper seating, air conditioning, and technology resources.

The participants placed particular emphasis on the necessity of the required facilities to impact the outcome of successful technology integration in the classroom. They shared the view that the institution should invest in specialized facilities in an effort to motivate instructors to use technology more frequently.

One minor theme that supported the major theme, technology facilities and technical support, was that technical support encouraged participants' use of technology. The participants gave contrasting views on the availability of technical support at the institution. Six of the participants were impressed with the kind of technical support provided. These participants mentioned the high levels of responsiveness displayed by

the technical support team, and the ability of the team to find solutions to problems as positive characteristics. Technical support was seen as one of the few systems available that encouraged participants to integrate technology. However, there were five participants who disagreed with their colleagues on the subject. These participants were of the view that the quality of technical support that existed needed improvement. Participants 0004 complained:

> We aren't getting enough support from the ICT Department. As I mentioned earlier, the administration of the institution is requesting that instructors use technology consistently in their lessons, but the Internet doesn't work. Sometimes the students complain bitterly. There is one projector for the entire department and everyone wants to use it the same day.

The participants identified technology support as one area that could be improved in an effort to assist instructors in achieving successful technology integration.

Methodologies Used by Participants

The sixth major theme identified during data analysis was methodologies used by the instructors during their teaching. There were several teaching methodologies identified by participants as being most effective when integrating technology. These methodologies were the pupil centered approach, student centered approach, problem solving approach, cooperative learning, discovery learning, and collaborative learning. The participants were very keen on the use of grouping as a teaching strategy during technology integration. Participant 0011 declared:

> I think using cooperative learning as a strategy has contributed to more students working in groups, because they don't all have laptops. Not all students have the required resources, so I put them into groups to explore the information. The students are given assignments, which they return and complete presentations in their groups. This is a reflection of the group directed approach, which is a very effective strategy.

The participants found grouping as a teaching strategy that allowed students to collaborate as learners and share resources. Participant 0006 stated, "I use the group approach, small groups in particular, where interaction provides opportunity for research. The use of grouping was consistent among most of the participants.

When asked which teaching strategies they found least effective, the participants cited the following strategies: guided discovery, the lecture method, role playing, and self-directed learning. Participants 0005, 0012, and 0013 were of the view that the lecture method is too dependent on the instructor, and is least facilitative. According to Participant 0005, "Sometimes, the lecture method can be a hindrance in terms of time when implementing technology integration. The lecture method can be very time consuming." Participant 0012 shared a similar view:

> Lecturing is least effective because it is too dependent on the lecturer. This dependency on the lecturer can encourage the lecturer to become less dynamic and use teacher-centered approaches such as scripted notes. There are other options such as PowerPoint and websites that could be used to display a lot of

> information. Lecturing is the least effective teaching strategy in my view, based on its characteristics.

The limitations of the lecture method can result in reducing the dynamism of technology integration, which often contribute to students' lack of interest in teaching and learning.

Training and Preparation of Participants

The seventh major theme identified during data analysis was the training, and preparation of participants. The participants identified additional training as a requirement for successful technology integration. Participant 0012, for example, confirmed:

> The idea of having ongoing training for the facilitators would be something that I would welcome. Since technology is constantly changing, it is difficult for us to keep current; therefore, hosting seminars and workshops with my colleagues would facilitate expertise sharing. I think this approach creates a good balance, and it improves the overall instruction and modeling for our students as well.

Participant 0013 also emphasized:

> Technology in education is very powerful in the teaching learning process, and ongoing training should be provided for lecturers. We cannot assume that lecturers would go and inform themselves of the new technologies available to them. There should be ongoing training at the expense of the institution to expose instructors to technology integration.

Participant 0010 observed:

> Training offers continuous improvement of the teacher/lecturer because of the exposure to lots of technologies. The beauty about using technology is that as an instructor you may ask students to do presentation, and during your observation you recognize that the students are fully embracing the use of technology. Students generally discover new information, and these concepts you were unaware of. I use the opportunity to request a demonstration of the functionalities of these new technologies.

Based on the experiences of the instructors, both formal and informal training play a significant role in the development of their competencies in the field of technology integration

The relationship between the preparation of participants to integrate technology into the classroom, and their ability to use the technology tools and applications effectively was mentioned by Participant 0007. This participant stated:

> I have been exposed to the ministry of education's directive of mandating all instructors to pursue a course in technology integration. But I don't believe the mandate addresses the issue or solves the problem of adequately preparing instructors to function on their own. Is there something I can do to make the screen simply larger? Is there something I can do, when the screen is distorted? What should I do? Rather than providing a theoretical training course, the ministry should ensure that the course is more hands-on. This would allow instructors to become more competent in technology integration and become problem solvers.

Participant 0012 asserted:

> Because technology is constantly changing, as an instructor you must keep abreast with what is happening. This includes organizing workshops, working with our colleagues, and having the persons with the expertise to sharing at those workshops. I think this would create a good balance, and would improve the overall instruction offered by my colleagues and provide more meaningful modeling for our students as well.

Prioritizing the training and preparation of the participants for technology integration is one strategy that could be included in the curriculum designed at improving the competence of instructors in the field.

During the observation of the classes, most of the participants demonstrated some competence in using technology in their teaching. All participants were comfortable using PowerPoint as a teaching tool. The assembling of the computer and multimedia projector to display PowerPoint presentations was generally performed either by students or a laboratory technician. One of the major weaknesses observed during the participants' use of PowerPoint was the poor design of the slides. It was quite common to observe text sizes that were too small, text was overused, and background colors displayed poor contrasting techniques. PowerPoint presentations done by students had similar weaknesses. There were many occasions when the size of the projected images was too small because multimedia projectors were positioned too close to the screens. However, the PowerPoint presentations done by the students were more colorful, more interactive, and more creatively designed. The designing abilities of the students were further

observed during their use of web based applications, such as websites, and blogs. This competence could be attributed to the compulsory technology course that all students were required to complete before they could be duly certified as trained teachers.

The institution's strategic plan provided details of need for the constant upgrading of the skills of persons using technology as an enabler for the institution's development. However, the participants were not convinced that the institution was doing enough to assist them in the achievement of this strategic target. Participants 0007, 0011, 0012, and 0013 expressed the need for additional training as an important intervention by the institution to address the weaknesses of instructors in the area of technology integration. Participants 0013 summarized the value of the training of instructors as:

> Technology in education has a very powerful influence on the teaching learning process, and ongoing training should be provided for all lecturers. We cannot assume that lecturers would go and inform themselves of the new technologies available to us. There should be ongoing training provided at the expense of the institution.

There was a consensus among the participants that a need exists for additional training of instructors in the field of technology integration. This additional training could be considered as a major intervention to address weaknesses of the instructors in their delivery of lessons fueled by technology integration.

Challenges Faced by Participants and Students

The eighth major theme identified during data analysis was the challenges faced by both participants and their students. The most common challenges identified by both

stakeholders were poor internet connectivity, lack of resources, and insufficient laboratory space. All participants stated that poor connectivity and limited resources were factors that prevented instructors and students from integrating technology sufficiently into their curricula. Participant 0010 stated:

> Not all students may bring a laptop to class, which could mean they do not own such a device. This could mean that some of our students may not have either a computer or internet access at home. Therefore, many of our students depend on the facilities at the college to use technology, and as a result they are on campus for many hours following the end of their classes.

Participant 0003 explained further:

> The first challenge I would mention is the unavailability of the technology to the students. Many students do not own a laptop or have access to the Internet. Some of these students actually expressed their dislikes about using technology because of the difficulties they experienced. The students have logged many complaints related to limited access to technology resources and poor Internet connectivity and I would like to have these matters addressed urgently.

Some participants shared the view that their criticisms of the common challenges they encountered when integrating technology was sometimes misunderstood as attempts to avoid using technology in their lessons. In contrast other participants were of the view that based on their observations, some of their colleagues who complained regularly about the challenges were, making excuses for not integrating technology sufficiently in their lessons.

When asked how they have dealt with the challenges they encountered during technology integration, the participants responded that they often used creative strategies to complete their lessons. Participants 0004, 0012, and 0013 reported that they brought their own resources to the classroom. Participant 0004 admitted, "Sometimes I take my own laptop to classes, but there is a challenge with the Internet. The Internet goes down and when I have my laptop I am forced to be creative and do things differently." Participant 0013 reported, "The scarcity of resources forces you to get your own equipment." Participant 0008 explained:

> I send e-mails with links in websites to the students at the end of my classes. This becomes very demanding on my time since it could have been done during the class period, but Internet access is unavailable. Now I use another strategy, I e-mail this information before class begins, therefore, students can prepare ahead of my classes.

Participants 0001, 0009, and 0010 explained that they became very frustrated when they were unable to access the multimedia projector, despite making attempts to follow the required procedures for booking the item. Participant 0001 declared, "The resources are limited, so I have to prepare my lessons in advance. The absence of Internet access made it difficult to engage the students in cases where they could use the internet to search for information." Participant 0009 also asserted, "Students should be able to quickly go on the Internet via their laptops, their phones, or tablets to conduct an immediate search for any clarifications and any misconceptions during a lesson. The Internet plays a vital role in the delivery of my lessons." The participants were often

disappointed at the impact of the lack of resources on their efforts to integrate technology in the classroom. Participant 0013 suggested, “We are forced to use our own resources. Hopefully, in the long run, the institution will make the technology that we need available to us.” Participant 0001 proposed the American model, “We need to adopt the American model where teaching resources are available to help enhance the teachers’ use technology effectively.” The class observations revealed that the shortage of resources was quite common, and on some occasions, participants were seen using the screens of their laptop computers to share information with their classes.

The participants reported that while some students could afford to purchase laptops, tablets, and smartphones, there were a large number of students without these resources. The group approach was used by the majority of participants to address this problem. Quite often, students were required to share their laptops and other devices with others. Participant 0012 summed it up as follows:

> The technology creates a sort of positive and competitive atmosphere, and each week the students try to outshine each other during their presentations. Although some of the coursework are not assignments to be graded, all students are interested in having themselves recorded and videotaped during these presentations.

Based on the views shared by participants, limited resources could create opportunities for instructors and their students to become creative practitioners and problem solvers during technology integration.

Tools and Applications Used by Students

The ninth major theme identified during data analysis was the different tools and applications used by the students during technology integration. All the participants explained that their students were frequently involved in the use of technology in the classroom. Students were observed using laptops, tablets, and smartphones. The students used these devices to be engaged in the use of PowerPoint, social media tools, and web based resources as common applications. Participant 0003 explained:

> The students are required to create an online quiz and upload it to the Internet. We utilize a specific web application called Schoology. Most students were willing to participate in the online learning experienced using Schoology. They utilize the problem solving technique where they become problem solvers.

The exposure of students to additional web-based resources such as Moodle, has contributed to more students using their Smartphones and tablets. Participant 0010 admitted:

> As the teacher, you may design your lessons so that students with smartphones and laptops can participate in grouping. Within a particular group you may have two laptops available or a laptop and a smartphone, which provides all the students with an opportunity to participate in the lessons.

The smart phone was heavily used by Participant 0005 to capitalize on its academic value of sharing electronic resources with students. This participant asserted:

> "In my classes, the video camera and the regular smart phone are used regularly. I capitalize on the use of the smart phone because it is so heavily used as a social

> tool. Sometimes, as teachers we tend to neglect the academic value that the smart phone provides. Everyone owns a smart phone. Therefore, I provide the students with opportunities to take pictures and manipulate these pictures, and share the results with the class.

The use of the smart phone by participants and their students demonstrated the value of this technology as a tool in allowing students and instructors to share content.

The minor theme associated with the major theme, tools and applications used by students, was students' use of gadgets such as smartphones. During the observations of the participants' classes, tablets, and smartphones were heavily used by students in classes. The use of these devices by students was not confined to academic purposes. Students were observed using their devices to access social media platforms while instruction was taking place. Participant 012 explained "While I use Facebook as a teaching tool, especially during group sessions, I would not use Twitter during these sessions because of the distractions that come with using both Facebook and Twitter." The use of web applications and social media tools by students was consistent among the responses provided by the instructors during the interviews.

Participants' Perceptions of Technology Integration

The tenth and final main theme identified during data analysis was a description of the participants' perceptions of technology integration. Participants shared varying views on the value of technology integration to the process of teaching and learning. Participants 0001, 0003, 0005, and 0008 shared the view that technology integration can be time-consuming. According to Participant 0001:

> Integrating technology into teaching is time consuming. It really takes a lot of your time to scrutinize the information and identify specifically what is appropriate for the objective you wish to execute when teaching a particular topic. Considering that i am not as competent as my students, this process can take some time to be completed.

Participants 0003, 0005, and 0008 emphasized the amount of time it took to prepare technology integration lessons. Participant 0003 stated, "Time becomes an issue because it takes some time for you to actually prepare a lesson properly. The students complain that it takes a lot of time to integrate technology. Participant 0005 concurred, "The viewing of a video may take half an hour, and if you are teaching a class scheduled for forty-minute session, the lesson time could be insufficient." This view was not shared by Participant 0007 who noted:

> Technology makes it much easier to deliver a large volume of information in a short period of time, so I do not to rely on written notes. Therefore, I can guide the students to locate the information, which actually promotes more self-directed learning among my students. This approach has made it more efficient to deliver my lessons.

The methodology used by the participants during technology integration could be considered as a determinant of how they perceived time as a factor during the process.

The participants were of the view that technology was not a panacea, and was not always reliable. Participant 0001 indicated, "Technology tools can fail to operate, and users should always be adequately prepared to have alternative strategies in case of such

failure." The failure of technology tools was seen as having a negative impact on the user by Participant 0005. He declared, "Teachers need to employ proper planning as one strategy that can prevent chaos in the event of failure in the technology. I always encourage my students to have another plan." Participant 0007 noted:

> The students have become too dependent on technology and they should realize that it is a tool that can fail. They ought to recognize that the technology cannot do all things for them. However, it is in their best interest to know how to use the technology. The younger children are not necessarily interested in PowerPoint; therefore, teachers must find alternative ways of engaging these students.

The participants highlighted some of the realities facing users of technology who are dependent on technology as the only tool for engaging their learners. Among these realities were student teachers being fully prepared to teach their lessons, and have alternatives for the technology tools they plan to use in their lessons.

The participants were of the view that more could be done to manage the process of technology integration by introducing technology during the early stages of development of children. This view was shared by Participants 0006, 0010, and 0013, who highlighted the need for more attention to be placed on the management of technology use by young children. Participant 0006 shared:

> Student teachers should appreciate the management of the process of technology integration. At the very least, each teacher should equip themselves with knowledge relating to what is available and how to make use of the tools. Teachers should always conduct evaluation of learners needs. There are some

> learners who have technology challenges, teachers should remember that. The teacher cannot represent all the technology the students require. They should be aware of technology "over kill." It is also important that teachers are aware of the low Internet penetration and limited access to computers, which face our students at all levels.

Participant 0010 stated:

> Careful examination of what is happening in the Jamaican society shows that the young children have access to a cell phone, meaning that at an early age they are exposed to some form of technology. Therefore, if teachers do not embrace technology in teaching, their students will become more competent than they are when it comes to technology use.

Participant 0006 suggested:

> Technology integration is a process that is evolving, and needs to be managed carefully to ensure that resources are used efficiently. The process can be underutilized and mismanaged by users. Therefore, we need to be careful that impact of technology integration on the students' learning is maintained. Technology should be implemented at the pre-school level, where the provision of resources is prioritized because the need is the greatest there. The majority of resources should be focused at this level.

Discrepant Cases

The discrepant cases identified from data analysis were the utility of technology integration by participants, and the nature of the supervision that occurred during the

process. Both cases were considered discrepant based on their inability to fit into the initial categories chosen during the data analysis. The discrepant cases brought into focus the absence of two important factors that could influence successful technology integration. Utility is defined as the extent to which the participants apply the functionality of the tools and applications to achieve the desired outcomes during technology integration (Cilesiz, 2011). Participants 0005, 0008, 0009, 0010, and 0011 mentioned using technology to achieve different objectives in technology integration. Participant 0009 described technology utility as "exposing you to a wide domain of information and providing substantial depth and breadth of information." Participant 0008, expressed a similar perspective, "The use of specialized software, for example geographic information system (GIS) technology along with videos from YouTube made the teaching of geography a little more exciting. Skills associated with GIS are also required by persons who in specific disciplines in the private sector and government service." Participant 0007 stated:

> The technology makes it much easier during my teaching. I am able to deliver large volumes of information in a short period of time, and as a result I do not have to rely on notes. Therefore, I can guide the students to the location of the information, which is actually promoting self-directed learning among the students.

The inclusion of the utility of technology integration as one of the main derivatives that drives successful technology integration into the classroom should be given some serious consideration.

The supervision of the implementation of technology integration is valuable to the success of the process. During the interviews, the participants identified the apparent absence of a mechanism to address the lack of supervision of the integration of technology as a problem. The participants recognized the importance of managing technology integration, but failed to mention who should actually supervise the process. The question of accountability among the participants participating in technology integration became a contending issue. Some participants appeared quite comfortable managing their own involvement in technology integration. For example, Participant 0002 stated:

> I have learned a lot on my own by interacting with the technology tools during the process, I learned just basic features of these tools. In terms of the more advanced features, I'm not using the principles very often; therefore, I am losing the skill. I would suppose I need more than encouragement to master using the tools.

Participant 0004 related her personal experiences using technology with her colleagues. She declared:

> I try to do my best when practicing technology integration. My colleagues shared a different view about my approach to the process. They are of the view that I am probably trying to make them look bad. However, I am not sure of the level of influence I am having on my colleagues. Therefore, I execute my tasks and I try to do my best at what I do. That’s my objective. I am unaware of if my colleagues are observing my methods and are influenced in the process.

Participant 0006 asserted, “Technology integration is an evolving process. It needs to be managed carefully to ensure that resources are used efficiently. These resources can be underutilized and misapplied, so we need to identify ways to maintain its impact on the classroom.” The efficient management of technology integration could have a positive impact on the result achieved by instructors who are engaged in the process.

Summary of the Findings

The adoption of technology integration into the curriculum of colleges and universities can have a positive impact on teaching and learning. This impact has specifically transformed the abilities of the participants to integrate such technology (Voogt, Knezek, Cox, Knezek, & ten Brummelhuis, 2013). In this study, I explored instructors’ integration of technology into their curriculum—an exploration that was designed to assist in the ongoing analysis of the pedagogy of participants in their curricula by providing additional information to the existing body of research. This section of the study represents a description of the rationale for conducting a qualitative research study, the description of the settings and participants, and the procedures that I adopted in conducting the interviews, observations, and documentation. An analysis s of the data that emerged from the main themes was also presented. Section 3 provides a description the actual proposed project.

There were several themes emerging from the data analysis, which highlighted the description of technology integration by the participants. These themes included the impact of technology integration on teaching, students’ abilities to integrate technology, and tools and applications used by participants. The themes provided answers to the

Research Question 1, “How does a group of college instructors from the Social Sciences department CI describe the integration of technology into their classrooms?”

There were three themes emerging from the data analysis that supported Research Question 2, “How do the participants demonstrate the integration of technology into their classrooms?” These themes were the philosophy of participants, technology facilities and technology support, and methodologies used by participants. Based on the responses of the participants to the interview questions, the observation of their lessons, and the analysis of documents, the participants were consistent in their use of technology during their teaching. Another major finding of the study was the philosophy of the participants that was directly related to the extent to which they used technology in their teaching. Participants who had a positive view of technology integration used technology more frequently than their colleagues who shared negative views. The final research question, Research Question 3, “How do the participants document the integration of technology?” was supported by four themes. These themes were training and preparation of participants, challenges faced by participants and their students, tools and applications used by students, and the participants’ perceptions of technology integration. The absence of training opportunities in the area of technology integration was identified by the participants as a major factor preventing them from integrating technology sufficiently. This affected their abilities to sufficiently plan lessons using technology integration strategies. While the institution identified training in technology integration as a major target in their strategic plan, there was no evidence of the manifestation of such training.

The utility of technology integration and the supervision of the process were the discrepant cases emerging from the data analysis. Utility of technology integration by participants and their students could be considered as having a major impact on the implementation of technology integration by being a necessity for users. The supervision of technology was perceived as an important element of the process that needed to be adequately managed. Based on the impact of the utility of technology and supervision of the process on the possible outcomes of technology integration, both cases could be considered as elements of the conceptual framework for technology use.

Conclusion

The limitations experienced by the participants in their attempts to integrate technology into their curricula were legitimate concerns that had a negative impact on the process of technology integration. The need for a professional development program as a source of intervention became evident as a valuable solution. The findings of this study, therefore, suggested the need for the design and implementation of a professional development program to address the shortcomings identified. The professional development program could be custom made to address the specific needs of the participants to improve their competence in their implementation of technology integration. Section 3 provides additional details of the proposed instructor professional development plan and implementation strategies. The main focus of the professional development workshop was to improve the participants' pedagogical competence as well as their ability to use technology tools and applications more effectively.

Section 3: The Project

Introduction

The purpose of this study was to explore college instructors' integration of technology into their curriculum. The instructors indicated, as revealed through analysis of the data, that they needed additional training to successfully integrate technology into their curricula. Based on the findings of the study in Section 2, the implementation of a professional development workshop would address the weaknesses of the participants in conducting technology integration. The professional development workshop is proposed as a solution to address the participants' inability to successfully integrate technology into their curricula in an effort to improve their pedagogy. The workshop will last for 5 days and will be designed to provide the participants with training in the use of technology applications and tools and modern methodologies to improve technology integration. During this training, the participants will be exposed to areas identified in the findings as themes.

The proposed intervention will provide opportunities for the participants to access hands-on training in an effort to satisfactorily implement the findings of this study. Technology-related professional development training is designed to address the limitations demonstrated by the participants during the study. During the study, they were unable to adequately integrate technology into their curriculum. The participants demonstrated weaknesses in their demonstration, description, and documentation of technology. The competencies shown by the participants during the integration of technology were below the expectations at the higher education level. Considering that

the participants have been involved in the training of student teachers, it was expected that they would have been more competent to adequately prepare these student teachers to use modern technologies in the classroom. The purpose of the professional development workshop is to improve the competence of the participants so that they will be adequately prepared to integrate technology successfully into their curricula. At the end of the period of training, the participants are expected to adopt strategies that will have a positive impact on the learning experiences of their students.

This section of the study contains the design of the professional development sessions and the implications of the study for social change. I present a description of the goals and a rationale for the professional development workshop. The review of literature provides an explanation of how the project genre chosen, namely, professional development training, will be implemented to support the findings of the project study. A description of the required resources and support, potential challenges, implementation and its schedule, and project evaluation will also be covered in this section of the project study.

Description and Goals

According to the study findings, the participants were not integrating technology sufficiently into their curricula. This was due primarily to the presence of factors such as limited resources, poor Internet connectivity, and a lack of adequate training in the area of technology integration. The professional development training project that has been developed focuses on the integration of technological tools in different curricula, with emphasis on the integration of web-based tools. I selected the TPACK professional

development model based on the approach taken regarding the integration of modern methodologies into the different curricula. I propose that a foundation engaged in the sponsorship of the institution should assist with budgetary support to purchase the relevant software and other materials required for the workshop. This foundation is a registered company designed to support the operations of the institution.

The goal of the professional development workshop will be to improve the competence of participants in the integration of technology into their curricula. This intervention could result in the participants becoming empowered to practice technology integration into their lessons. I will focus on the achievement of student outcomes in an effort to improve the learning experiences of students. It is anticipated that the participants will become more proficient with the use of technology, and as a result, develop the technological competencies of their students. The profile of the institution as a technology-driven entity is expected to be enhanced with an increase in the number of participants who are competent in technology integration.

Rationale

According to the findings from this study, the participants required professional development training in an effort to improve their competences in technology integration. They identified the need for additional training as one of the major interventions that could satisfactorily address their weaknesses in technology integration. The overuse of PowerPoint and limited use of web-based tools by some participants were examples of the weaknesses that will be addressed in the professional development workshop. Targeting the integration of modern technology tools such as Prezi, wikis, Webquests,

storyboards, social learning tools, and multimedia learning tools will provide the participants with the required foundation to successfully integrate technology into their curricula. At the end of the professional development workshop, it is expected that the participants will have more experiences using a larger repertoire of technology tools available to integrate into their curricula. The integration of modern technology applications into the curricula is expected to excite the students who are classified as tech-savvy and creative in their use of technology.

The institution's web portal contains resources that can accommodate the professional development workshop. A website will be designed on the web portal to facilitate the integration of the applications required for the workshop. The Moodle LMS resource will accommodate the establishment of a repository of the applications, which would allow the participants to access the resources for the workshop online. Furthermore, the tools available in the electronic library will be integrated into the workshop to maximize the research component of the training. Hosting the workshop in the e-learning center at the institution will allow the participants to benefit from the use of different technology tools such as document cameras, the Smart board, and electronic storage. The professional development workshop will be designed to improve the competence of the participants in the integration of technology into their curricula.

Review of the Literature

The participants highlighted the need to acquire additional training to improve their competencies in technology integration. Although the participants were knowledgeable about student-centered methods and content in their curricula, they

demonstrated weaknesses integrating a wide range of tools and applications into curricula. Some of participants had negative perceptions toward the value of technology integration in the teaching and learning process. There has been a concern that the beliefs and perceptions of instructors have influenced instructor practice and knowledge (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). These beliefs and perceptions need to be converted into good practices of technology integration strategies. This conversion is facilitated by the implementation of a professional development program (Avalos, 2011). Therefore, I designed the planned professional development workshop to address the findings of the study.

The impact of the findings of the research study on the design of the professional development workshop is an important feature of the proposed training program. The participants stated that professional development should be designed to systematically target improving effective use of technology in teaching by instructors (Hutchison, 2012; Kim, Kim, Lee, Spector, & DeMeester, 2013; Rienties, Brouwer, & Lygo-Baker, 2013). Avalos (2011) articulated that this training should focus on the degree to which participants learn, and how their learning efforts are reflected in their beliefs and practices. Effective professional development has been translated into positive changes in attitudes and practices with technology among participants, resulting in improvement in their abilities to plan and implement technology-infused lessons (Kopcha, 2012). According to Gerard, Varma, Corliss and Liner (2011), the positive attitudes and practices of the participants have been consistent with their implementation of new instructional ideas and engagement that guides the pedagogical framework necessary for

effective technology integration. The detailed analysis of the impact of professional development programs can provide a framework for the design and implementation of these programs based on frames of references provided in previous studies. The following subsections will provide a summary of what researchers have presented as best practices related to the constituents of the planning, designing, and implementation of effective professional development workshops.

Conducting the Literature Review Search

Professional development is the major topic for this literature review. Conducting a literature review is an important step in the research process that brings clarity and meaning to research topics, such as professional development (Seuring & Gold, 2012). Professional development is a popular initiative employed to address weaknesses of instructors in the area of technology integration (Seuring & Gold, 2012). One of the outcomes of research studies on professional development is the improvement of participants' competence, and in the literature review, I seek to highlight this impact, specifically in the areas of technology integration.

Several search strategies were applied in the search. Walden University's online library resources were instrumental during my search. The resources created a platform for an extensive search for the concepts in the context of higher education. The online databases that I accessed were ERIC, Education Research Complete, SAGE Premier, and ED/IT Digital Library from the Education Databases. ProQuest Central and Academic Search Complete from the Multidisciplinary Databases also provided additional support for a more in-depth search. Next, I used Google Scholar to broaden my search on the

specific search terms. Terms that generated information included *technology integration, professional development, technology tools and applications, methodologies used by instructors, philosophy of instructors, training of instructors, instructors' perceptions of technology integration, challenges faced by instructors and their students, TPACK, online training and TPACK,* and *utility of technology integration*. The result of the search produced a number of scholarly studies that suited the requirements of the section of my project study.

The different headings presented in the literature review established a platform on which the design, implementation, and possible challenges related to the proposed professional development program. The first heading, Designing Effective Professional Development Programs, is used to explain the value of implementing a professional development program as an intervention to solve the problem faced by the participants. In the next section, using the TPACK Model for Professional Development, I present details of the model proposed as the professional development program. In the final section, Factors Influencing Instructors' Use of Technology, I highlight the possible challenges encountered during the implementation of a professional development. The scholars presented in the review of literature have extended the discussion on the various topics to justify the intervention selected for the professional development training.

Designing Effective Professional Development Programs

Effective professional development programs can create a launching pad for improving the competencies of instructors in their pedagogy and day-to-day operations in the classroom. The design of effective professional development is central in achieving

improvements in teacher practices that result in higher levels of student achievement (Antoniou & Kyriakides, 2013). Antoniou and Kyriakides (2013) agreed that the relationship between effective professional development programs, improvements in teaching skills, and student achievement were critical in the establishment of a conceptual framework to determine the effectiveness of professional development programs. The conceptual framework has created a foundation on which the design effective professional development programs can be executed. The design of effective professional development programs can be considered as central to the preparation of instructors in the areas of pedagogy.

The assessment of effective professional development programs is an important element of the design of such programs. Assessing effective professional development programs provides information on factors such as learner satisfaction and the experience of instructors in the field of technology integration (Rienties, Brouwer, & Lygo-Baker, 2013). The information gleaned from the assessment of professional development programs can provide structure to the design and execution of these programs. The value of assessing professional development programs designed to prepare instructors to integrate technology can be significant in building instructor competence. It is, therefore, necessary for an examination of the functions of effective professional development programs to guide the design of these programs.

The definition of the functions of an effective professional development program is paramount in the process of addressing the weaknesses demonstrated by the instructors

during the collection of observation data. According to Desimone (2011), effective professional development is characterized by five core functions:

- Content focus: Emphasis is placed on subject matter content and how students learn the content.
- Active learning: Teachers have the opportunities to observe and receive feedback as opposed to passively sitting through lectures.
- Coherence: There is consistency in knowledge and beliefs with other professional development programs driven by school, district, state reforms, and policies.
- Duration: Activities are spread over a specific time—if the program is designed over a semester, it should include 20 hours or more of contact time.
- Collective participation: Groups of instructors from the same grade or subject participate together to build an interactive learning community.

The core functions of professional development programs can provide details of how to address the challenges faced by participants during instruction and ways of identifying possible solutions. Participants are often motivated by opportunities to address problems and create solutions signals their preference to participate in learning activities that mirror the direction and pace of their own learning (Hunzicker, 2011). Hunzicker (2011) believed that effective professional development programs should be supportive, job-embedded, collaborative, and ongoing, and have an instructional focus central to the possible solutions. The overall quality of effective professional development programs is subject to improving the professional practice of instructors, while facilitating improvements in students' learning (Lumpe, Czerniak, Haney, &

Beltyukova, 2012). The dependence on effective professional development programs to address the needs of both instructors and students points to the importance of universities and colleges achieving the demands of the reforms of the education system. The design of effective professional development programs can be identified as a step toward developing quality instructors and promoting effective learning among students.

Effective professional development cannot be limited to providing participants with the inputs such as expertise in subject matter and competence in using tools and devices. Emphasis on pedagogy is central to the design of a successful professional development program. Designing professional development programs to ensure that participants benefit by reflecting individually and collectively on their own instructional experiences is a recommendation intended to promote successful programs (Van Driel & Berry, 2012). These programs encourage instructors to set their own goals and engage in self-reflection; providing participants access to well-needed materials is an interpretation of the programs' ongoing success (Cunningham, Etter, Platas, Wheeler, & Campbell, 2015). Therefore, the overall management of effective professional development programs should take into consideration the implementation of structures designed to build the competencies of instructors in developing their pedagogy in the classroom.

To support the development of technology integration skills and knowledge of participants in a professional development program, researchers suggested different models to achieve the sustainability of the effects of such programs. Some of the common models suggested include the dynamic integrated approach (DIA) model, derived from the grouping of teaching skills, and the TAM designed to specify the

usefulness, ease of use, attitude toward use, and the behavior intention to use technology (Antoniou & Kyriakides, 2013; Teo, 2011; Toe, 2012). The TPACK model is presented as the most common conceptual model to effectively design and implement technology-enhanced lessons (Benson & Ward, 2013; Niess, 2011; Rienties, Brouwer, & Lygo-Baker, 2013; Van Driel & Berry, 2012). The model creates a balance between technological, pedagogical, and content knowledge, which establishes a springboard for the success of an effective professional development program. The modular approach to the implementation of professional development is one way of providing an established structure to the execution of these programs.

Using the TPACK Model for Professional Development

The uniqueness of the TPACK model is a description of its effectiveness as a viable intervention necessary to tackle limitations in instructors' abilities to integrate technology. The TPACK based professional development program prepares instructors to be flexible and inclusive in accommodating their philosophies, styles, and approaches while implementing technology integration (Harris & Hofer, 2011). According to Van Driel and Berry (2012), the characteristics of the TPACK include a shared form of teachers' professional practice, which allows individual participants to adapt the shared knowledge to complement their own realities. The TPACK model, therefore, remains a platform for the correlation of e knowledge, beliefs, attitudes, and behaviors with classroom practice in an effort to inspire student learning (Walker, Recker, Ye, Robertshaw, Sellers, & Leary, 2012). A consequence of using the TPACK model is the creation of path to critically assess the impact of a professional development program on

the growth and development of the participants. The success or failure of the TPACK model can be attributed to its distinct phases and articulation of the requirements of the specific stages during its implementation. The structure of the TPACK model is often defined by experts as having an overall impact on harnessing all the available resources required to initiate the success of an effective professional development program.

The phases of the TPACK model are presented by different researchers as illustrations that instructors can use during their implementation of technology integration. Several researchers suggested that the three phases of the TPACK model—acceptance, technological, and pedagogical modeling, and pedagogical application—are instrumental in building the confidence of instructors while they practice technology integration (Abbitt, 2011; Graham, Borup & Smith, 2012; Koh & Divaharan, 2011; Pamuk, 2012; Voogt, Fisser, Pareja Roblin, Tondeur, & van Braak, 2013). The universal acceptance of the TPACK model is a representation of its effectiveness in the design of a professional development program that targets improvements in instructors' practices. The effectiveness of this model is based on the model's far-reaching capabilities during its implementation as a solution to address the participants' limitations in their abilities to integrate technology successfully.

The effectiveness of the TPACK model has brings into focus the revolution in the application of different modalities in the execution of professional development programs. Several researchers have suggested that the implementation of the online component of professional development programs is a very creative way of improving participants' attitudes toward online learning (Alsofyani, bin Aris, & Eynon, 2013;

Anderson, Barham, & Northcote, 2013; Benson & Ward, 2013; Tømte, Enochsson, Buskqvist, & Kårstein, 2015; Walker, Recker, Robertshaw, Sellers, & Leary, 2012). Based on the flexibility of the model in removing time constraints, and its ability to harness the inclusion of international experts, the TPACK model is now conceived as an internationally accepted conceptual model that has transformed professional development training. It is quite common for instructors to benefit from online professional development programs, and during the process use the TPACK model to balance technology integration, pedagogy, and discipline knowledge (Rienties, Brouwer, Bohle Carbonell, Townsend, Rozendal, van der Loo, Dekker, & Lygo-Baker, 2013). This revolution in the delivery of professional development program has resulted in the use of different modalities, which offers greater flexibility in the training of instructors. Colleges and universities can now benefit from applying the diversity of these modalities to achieve more creative options presented by the TPACK model in their delivery of creative professional development programs.

Modern technology is commonly associated with the delivery of professional development programs that apply the principles of the TPACK model. The model has emerged as a viable approach to the design of professional development training using online and/or the blended approach as a mode of conducting professional development training for instructors (Anderson, Barham, & Northcote, 2013). Rienties et al. (2013) suggested that the blended approach to professional development training has harnessed different perspectives, disciplines, and experiences while creating a more flexible and convenient training program. Infusing the blended approach with the TPACK model can

influence instructors to become more innovative as they thrive to become experts their delivery of meaningful technology integration into their disciplines. As the transition takes place from face-to-face instruction toward online and blended modalities, the TPACK model is positioned to create more opportunities for participants to access professional development training irrespective of their geographic location. While there is some anticipation of the possible challenges that can be encountered during the process, this transition has the potential to transform professional development training.

With the onset of the integration of modern technology as a platform to conduct professional development training using the TPACK model, there is a likelihood that the implementation of professional development will be challenged. An assessment of the effectiveness of the TPACK model shows that are challenges associated with the underlying complexity within the integration of the different components of the model, making the constructs ill-defined (Graham, 2011). Graham suggested that this complexity has led to a call for more precise definitions of the components in the model to ensure coherence in the interpretations required to guide the execution of the professional development program. The need for establishing a clearer rationale for the purpose of each component in the TPACK model remains a major challenge to be addressed. Graham (2011) concluded that despite the fundamental weaknesses identified in the TPACK model, it remains a strong framework that can guide instructors to use technology in content-specific as well as general ways. In an effort to satisfactorily address the challenges associated with the TPACK model, educators should become

knowledgeable of the implications of these challenges to realize the benefits of a successful professional development program.

Factors Influencing Instructors' Use of Technology

In a bid to encourage instructors to embrace technology integration in their practices, factors such as the impact of the modular approach and the potential benefits of a student-centered approach are integral to their ongoing training. These factors are instrumental in capturing the interests of instructors based on the organized structures presented by both approaches (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Funkhouser & Mouza, 2013). The role of the student-centered approach in influencing instructors' pedagogy and its association with models such as the TAM have brought into focus the intricacies of technology use (Cheung & Vogel, 2013). Professional development training can, therefore, be visualized as a viable intervention to provide instructors with the necessary tools to deal with the intricacies. The application of both the modular and student centered approaches as a part of the design of a professional development program can influence instructors to become more proficient in their use of technology. In the context of encouraging instructors to use technology in their classrooms, professional development training is designed to foster student centeredness through the use a modular approach.

The extent to which the modular approach is effective in improving the competency of teachers in the use of technology is worth researching. One implication of using a modular approach is the aligning of the context of the professional development program to the value beliefs of the instructors (Ertmer, Ottenbreit-Leftwich, Sadik,

Sendurur, & Sendurur, 2012). Understanding the pedagogical beliefs and practices of instructors is critical to successful technology integration (Mama & Hennessy, 2013). Mama and Hennessy (2013) suggested that these beliefs, along with their lack of technology skills and lack of opportunities for training were related to instructors' teaching philosophy. Addressing the successful integration of technology requires the intervention of a professional development training program that takes instructors' pedagogical beliefs and practices into account. Such professional development programs can be considered significant intervention in addressing these weaknesses related to instructors' practices during their implementation of technology integration.

Using the student centered approach was another option in training instructors to use technology more efficiently in the classroom. This approach provided more options in the process of improving the classroom practices of instructors. The shift toward the use of student centered approaches by instructors has been strongly correlated to their practices in technology integration (Funkhouser & Mouza, 2013). The extent to which a professional development program contributes to the use of student centered approaches by instructors has been significant in the ongoing improvements in their knowledge and skills in technology integration. Researchers maintained that the use of student centered approaches by instructors while integrating technology has been a major contributor to the development of real-world skills such as communication, collaboration, critical thinking, creative thinking, problem solving, and decision making among students (An & Reigeluth, 2011; Ertmer & Ottenbreit-Leftwich, 2013; Liu, 2011; Pegrum, Oakley, & Faulkner, 2013; Rienties et al., 2013). According to An and Reigeluth (2011), a

professional development program related to training in technology integration has been ideal for providing support to instructors in creating technology enhanced student centered classrooms. One of the common denominators of successful technology integration is the use of student - centered approaches to guide the direction of technology use by instructors and their students. The design of successful professional development programs will require the removal of the associated barriers, such as negative beliefs and perceptions, while providing instructor support by adopting methodologies that are conducive to student learning. Therefore, the adoption of the student-centered approach is important in the execution of a successful professional development program to prepare instructors for technology integration.

The overall impact of a well-designed professional development program is critical in addressing the weaknesses demonstrated by the participants who participated in this study. The structure of these programs based on the principles of the TPACK model has provided a pathway for the execution of quality training of instructors involved in practical disciplines including technology integration (Lumpe, Czerniak, Haney, & Beltyukova, 2012). The structures are carefully designed to outline the development of standards and principles that govern the use of technology in the classroom by instructors to improve their pedagogical skills at the institution. The proposed TPACK professional development program will focus primarily on the strengthening of the pedagogical skills and competencies of the participants as they seek to successfully integrate technology into their curricula. There is an expectation that the program will benefit the students in their application of technology integration into their teaching and learning activities.

Project Description

In this section, I discussed various aspects of the project description, including (a) potential resistance and existing supports, (b) potential barriers to completion, (c) implementation and timetable, (d) and the roles and responsibilities of students and others upon completion. I, (a) delivered the completed TPACK professional development program to the vice president of academic affairs at CI, (b) presented the findings in person at a specially arranged meeting to the members of the social sciences department, and (c) offered my services as a consultant to the institution to assist in the implementation of professional development programs.

Potential Resources and Existing Supports

The resources that will be used to ensure the efficient implementation of the workshop are the e-learning laboratory, containing the interactive Smart board and 50 computers with Internet connectivity and a color printer. These resources will be available to the participants, who will access the resources at any time. Since all the resources required for the training will be uploaded to the Moodle resource, the participants will be required to download these resources and print them using the printer in the laboratory. The web based resources available to the participants will be downloaded on all the computers in the e-learning laboratory before the training. The participants will be required to create login credentials for the wiki on wix.com, Prezi, the blog on e-blogger, and access to Moodle. The Moodle page will be divided into the different days (Day 1, Day 2, and so forth) with the different resources required for each day. At the beginning of the page, the participants will have access to an overview of the workshop, schedule,

and introduction of the facilitator. Within each section of Moodle page, the specific instructions and additional resources to support the training will be made available. Furthermore, a special section will be available on the Moodle page for the participants to upload the different resources created. The software required for the full functioning of the Smart board will be provided by the foundation of the institution.

Potential Barriers

The absence of a staff development unit at the institution with responsibilities for the implementation of professional development workshops for staff will pose a potential barrier. Currently, professional development workshops are conducted over a one-day period at the institution. Consequently, participants may resist attending a week-long professional development workshop. The allocation of insufficient time to professional development workshops for instructors does affect the quality of such programs and efforts should be made to facilitate adequate time for effectiveness (Ikenwilo & Skåtun, 2014). The success of a professional development program will be dependent on the investment in the time allotted to the implementation of this workshop.

The support of the administration of the institution is essential to successful implementation of this professional development training program. Administration support will be significant in engendering workplace support for the program. The nature of the support to be provided by administration is a reflection of the culture of the institution, an indicator of its ethos related to the implementation of professional development (Avalos, 2011). Since the one-day professional development workshops are always planned by the human resources department, there could be some reluctance by

that department to provide the required support for the planned one-week workshop. The support that will be required from this department includes the provision of meals and technical support for the implementation of the proposed professional development workshop. Consequently, there will be a contingency plan in place for the provision of meals as the foundation of the institution is willing to provide such assistance.

The possibility of participants who are less competent in the area of technology integration failing to complete the training is another potential barrier. Therefore, it will be necessary to make special efforts to reduce the occurrences of frustrations and discouragement among the participants to ensure that they will complete all the required activities during the workshop. The establishment of faculty learning communities that are operated as collaborative collegial groups is an innovative way of increasing retention during and after the implementation of professional development programs (Ward & Selvester, 2012). One practical way of strategically addressing the weaknesses demonstrated by participants in the area of technology integration could be the implementation of the learning community concept to leverage the required support for the instructors. This notably intervention is anticipated to drive the overall implementation of the proposed workshop over the designated period.

Proposal for Implementation and Timetable

The professional development workshop will begin once the president of the institution grants permission for its implementation. Following this approval, the participants will be notified verbally and by email about the dates for the workshop. The institution usually allots the second week in January of each year for staff development

activities and preparation for the new semester. The staff development workshop is scheduled to last for 5 days within this allotted time, and this period will be ideal for the execution of this proposed professional development workshop.

Before the beginning of the workshop, the participants will have the opportunity to email questions about the workshop to me as the facilitator, and I will respond to these questions. Where applicable, suggestions arising from the participants in their emails will be accommodated within the training sessions. During the first session of the workshop, I will provide answers to any other questions raised by the participants sharing in the workshop. Throughout the workshop, the participants will have the opportunity to participate in hands-on activities that are designed to improve their competence in technology integration (see Appendix A for scheduling).

As the facilitator of this TPACK driven professional development program, I have designed all the materials and the structure of the program to be executed over the designated period. Day 1 will be reserved for the introduction of the workshop participants and the facilitator. At the beginning of the session, there will be an introduction of the director of the curriculum unit, librarian, and the system administrator. As the facilitator during this session, I will provide details of the training program, and inform the participants of the resources to be used and expected behaviors of them. I will further provide these participants with the login credentials to the Moodle web resource that will be used to host all the resources for the workshop before the training. Afterwards, I will conduct an orientation to the use of Moodle, targeting the use of and

access to these resources. Finally, I will introduce the participants to the creation and creation of a wiki, which they will use as a repository during the training.

On day 2, a review of the design of the wiki will be done at the beginning of the session. The system administrator assigned to the training will assist participants requiring support. The main activity of the session will be the introduction of the participants to the designing of a Webquest and a blog using e-blogger. The librarian will complete a short presentation introducing the participants to the resources in the e-library and tips on using web-based resources. Following the presentation, the participants will create Webquests in small groups based on their curricula. Each group will choose a practical topic, and each participant will be assigned specific tasks to complete the Webquest. Each participant will design his or her own blog and respond to the blog question on the Moodle page. At the end of the session, all participants will be required to post the Webquest and Blog into the specific area identified on the Moodle page.

Day 3 will begin with a review of the previous day's lesson. This will be followed by the introduction of another web based tool, Prezi, to the participants. The latter will be exposed to the operation of the interactive Smart board. During the session, the participants will design individual Prezi presentations using topics from their curricula. Then, they will post their completed Prezi presentation on the wiki they created and on the designated space on the Moodle page.

On day 4, the participants will begin the session by completing basic demonstrations on the Smart board. The director of the curriculum unit will conduct a short presentation on the standards associated with designing interactive lessons. The

designing of technology enriched lessons using topics from their curricula will follow this activity. The participants will be required to develop interactive lessons using PowerPoint to display different technology applications. The lessons will be developed in groups with each participant having the responsibility of designing at least one activity for the lesson. All these lessons will be posted on the wiki and on the Moodle page.

The workshop will end on day 5 with the presentation of the interactive lessons designed by the participants. The latter will be asked to invite their colleagues to the session during the presentations. These presentations will be done on the Smart board using the Wiki that was developed at the beginning of the workshop. A small team of three persons, including the dean of the faculty, the director of the curriculum unit, and the librarian, will conduct an evaluation of the presentations. The evaluation team will give a brief report on the outcome of the presentations. At the end of the reports, the participants will be required to complete an exit survey, which can be found in Appendix A.

Roles and Responsibilities of Student and Others

My role will be to create the materials for the workshop and be the facilitator. These responsibilities will include designing the Moodle page for the training, assisting the participants to gain access to the various web resources that will be used during their training, and monitoring the submission of completed tasks on the Moodle page by the participants. As the facilitator, I will lead all the different sessions including those related to the use of the interactive Smart board.

The director of the curriculum and the librarian will conduct short presentations that will complement the lessons provided by me as the facilitator. The presentation from the director of the curriculum unit will be related to the design of interactive lessons; the librarian will focus on the use of resources present in the e-library. I will lead the sessions by using the Smart board as the main presentation tool, supported by the integration of online web based applications. The participants will be expected to share their pedagogical experiences during the sessions since they are knowledgeable about using student-centered methods. The system administrator at the institution will be available to provide general technical support, especially related to hardware and software operations and Internet connectivity matters during the training sessions. Table 5 shows a description of the roles and responsibilities of all the persons participating in the professional development workshop.

Table 5

Roles and Responsibilities of Participants

Participants	Description of Responsibilities
Facilitator	Design the activities for the workshop, manage the daily sessions efficiently, and evaluate the different items completed by the participants. Design the Moodle page, provide assistance to the participants with access to all the web-based resources, monitor the resources on Moodle, and conduct training of participants to use the interactive Smart board.
Director Curriculum Unit	Present standards and guidelines for designing lessons and evaluate final presentation by participants.
Librarian	Present the use of the resources in the e-library and evaluate final presentation by participants.
System Administrator	Load the computers with the required resources, and provide technical support for the training
Participants	Bring all the required resources to the various sessions, Consult the Moodle page for announcements and activities and participate meaningfully in all activities

Project Evaluation Plan

Achieving effective evaluation of professional development training is dependent on the execution of the five levels of professional development evaluation. These levels will include participants' reactions, participants' learning, organization support, and

change, participants, use of new knowledge and skills, and student learning outcomes (Guskey, 2002). The goals of the workshop will be measured by the ability of the participants to integrate technology effectively into their curricula. The evaluation is designed with the five levels of professional development evaluation in an effort to improve the effectiveness of the professional development program. The objective of the evaluation will be to explore the potential recommendations that can be initiated to improve the program (Guskey, 2002). The evaluation of the program is a reflection of valuable information that can be used to explore the effectiveness of the professional development workshop.

The focus on the outcomes of the professional development program will be critical in evaluating the effectiveness of the program. Once the overall goal of the workshop is to develop the technology integration competence of the participants, it will result in the stimulating student learning in the different curricula. The ability of participants to seamlessly integrate the specific technology applications in the curricula will determine the success of the workshop. Therefore, at the end of the workshop, all participants will be required to complete a survey to determine the impact of the workshop on their technology integration skills. Additionally, data collected from the survey could be used to ascertain the participants' views on the quality of the workshop and the competence of the facilitator.

In an effort to evaluate the sustainability of the effectiveness of the professional development workshop, I will contact the participants following the end of the training sessions. Arrangements will be made with the head of the department to conduct random

observations of the participants teaching, at their convenience, to determine the effectiveness of the workshop. At the end of each observation, a verbal discussion will be held with each participant to determine his or her experiences integrating technology, the challenges encountered, and the students' responses. The continuous nature of professional development will provide an opportunity to implement strategies to maintain the effectiveness of the training in accomplishing its goals. One long term goal of the exercise is the sharing of the best practices of the participants with their colleagues from other departments. There will also be the possibility of establishing a trainer-of-trainers program to expand the impact of the professional development program on the participants' performances and students' outcomes.

Since formative evaluation will provide information about the effectiveness of the professional development training program, it will guide the process of identifying continuous recommended changes to its design and implementation. The evaluation of the TPACK professional development program could benefit the participants in a meaningful way based on the recommendations emanating from the evaluation. These recommendations can become avenues for establishing communication with key stakeholders, including sponsors of professional development programs and other interest groups, to attract well needed support. Formative evaluation can become an important source of significant support that is required to implement a successful professional development program.

Project Implications

Potential Social Change in the Local Community

The impact of technology on the growth and development of communities can be considered to be very staggering. Institutions have become one of the largest beneficiaries of such growth and development, and the leadership of these institutions is now forced to pay close attention to the demand of stakeholders who are showing considerable interests in this area (Shieh, 2012). The current advances in the areas of technology used in the classroom have become subjected to increased reform by governments to address educational standards and assessments and how technology is used beyond the classroom (Wildner, 2013). In the No Child Left Behind Act of 2001, the recommendation was made by legislators that all students should become technologically literate by eighth grade, and technology should become an important support for teaching and learning (Potter & Rockinson-Szapkiw, 2012). Therefore, institutions are accountable to the state and other stakeholders for their efforts to implement technology integration in meaningful ways that will eventually transform the economic, political, and social life within the society (Wildner, 2013). The larger expectation of the society is for institutions to implement technology integration successfully in an effort to support quality teaching and learning for all students. Technology integration in the classroom can, therefore, become a vehicle for social change as it empowers participants to adopt pedagogy that can transform the classroom environment into a collaborative environment, which promotes optimal learning for all students.

Potential Far-Reaching Social Change

There is a larger anticipation that a positive social change will be inculcated among the instructors who participated in the professional development workshop. This change could result in these participants becoming agents for transforming the pedagogy among their colleagues who did not participate in the training. Implementing similar professional development workshops in other colleges will have a ripple effect on the transformation of pedagogy to embrace technology integration as a main support for teaching and learning. Professional development programs can be an efficient vehicle for the evolution of best practices among instructors and should become standardized in institutions (Earley, & Porritt, 2014; Tondeur et al., 2012). The role of professional development in the transformation of higher education institutions into technology innovation centers is not beyond their capabilities, but requires a new vision that will create a change in culture (Avalos, 2011). Leaders in higher education need to make greater investments in professional development programs to reap the benefits of its impact in aligning professional learning opportunities of instructors with the reform of institutions' technology integration capacity (Saroyan & Trigwell, 2015). Higher education institutions struggling to adopt a culture of integrating technology into their curricula could utilize the TPACK professional development workshop model proposed in this study as a template to achieve such objective.

Conclusion

The proposed TPACK professional development workshop is designed to empower the instructors to become more proficient in technology integration. The

interactive nature of the workshop and the structured high level of support embedded in the design, are important features of the intervention. It is anticipated that instructors will benefit from exposure to the integration of modern technologies in the curriculum and opportunities to practice new teaching approaches. The overall impact of the proposed TPACK professional development workshop is expected to transform the competencies of the instructors and improve the profile of the institution as one on the cutting edge of technology.

In Section 3, the focus of the review of literature is on the design of the proposed professional program, its implementation, and the possible challenges encountered during the process. The themes discussed in the literature review include designing effective professional programs, using the TPACK model for professional development, and factors influencing instructors' use of technology. The section also addresses the implications of the literature review for college instructors involved in technology integration. In Section 4, I provide my reflections and conclusions, including directions for further research. .

Section 4: Reflections and Conclusions

Project Strengths and Limitations

In this section of the project study, I present the strengths and limitations of the college instructors' attempts to integrate technology into their curricula. Also presented in the discussion are reflections of scholarship, project development and evaluation of the professional development workshop, and leadership and change. Additionally, I documented a comprehensive reflective analysis of self as practitioner and project developer as a part of the exploration of the project study. The section concludes with an analysis of the project's potential on social change, direction for future research, and a detailed summary.

The strengths of this research study and the associated professional development program are as follows:

1. The presentation of an extensive literature in Sections 1 and 3.
2. A succinct description of a TPACK model professional development program designed to train college instructors to effectively integrate technology into their curriculum.
3. An opportunity for local stakeholders to assess the outcomes of the evaluation of the professional development program in an effort to contribute their input/resources to the technology integration process.
4. An opportunity for college instructors to access quality training in the integration of modern technologies into their curricula. The instructors

have expressed an interest to participate in additional training opportunities to become more competent in technology integration.

5. An appropriate research topic based on the focus by the government of Jamaica to strengthen the structures and curricula programs designed to integrate technology at all levels of the education sector.
6. A timely research topic given the need for teachers in training and in-service teachers to demonstrate modern pedagogy using technology to engage the younger generation of students. The current generation of students is tech-savvy and responsive to the use of technology in the classroom.

The project was limited to a case study of one department in a teacher training institution in the Caribbean. Therefore, the professional development program is not generalizable to a larger population. A professional development program effectiveness is limited to the data collected that are related to the specific program (Cunningham, Etter, Platas, Wheeler, & Campbell, 2015). Because students were not involved in the data collection associated with the program, the entire spectrum of the classroom learning environment was not analyzed. This weakness could contribute to the possible vagueness of the outcomes of the professional development program in adequately addressing the needs of the participants to successfully integrate technology. There is also a possibility that different participants involved in the program could be affected based on their cultural and educational background, pedagogical and content knowledge, previous professional experiences, and current teaching practice (Graham, 2011). The need to

design a professional development program that can lead to a transformation of participants in such program to develop pedagogical competencies can be measure of the success of that program.

Recommendations for Alternative Approaches

Based on the need to evaluate the overall impact of the professional development training program and the need to address the problem differently based on the overall work involved, the following questions will be posed in an effort to gain reasonable answers: How can you address the problem differently? What alternatives might be considered in addressing this type of problem? As presented in Section 1, limitations in the use of technology in the curriculum in teacher education at the university level (Garner & Bonds-Raacke, 2013) were reasons for conducting this local case study. To ensure that the web-based professional development program is applicable outside of the local setting, the participants will use available internationally proven technology integration applications (Boud & Hager, 2012). Efforts to conduct additional research on technology integration and the use of professional development programs as interventions to address the local problem may uncover additional best practices in teacher education at the higher education level.

As an alternative to having the participants attending the workshops physically, the participants could be engaged in a professional development workshop that is designed to use the blended or hybrid modality. The advent of new hardware and software technologies that facilitate the hosting of teleconferences and webinars, which are free to the public in some instances, is a development for the delivery of professional

development programs. This approach could remove the time constraints that can negatively affect participants whose responsibilities would make it difficult for them to attend face-to-face sessions. An added benefit of attending a technology-driven professional development program could be the awarding of certification of participants in continuing education related to the field of technology integration. This certification could function as an incentive for other instructors to participate in similar professional development workshops.

Scholarship, Project Development and Evaluation, and Leadership and Change

In this section, I provide a description of what I learned about the specific processes associated with research and the development of the project. A working definition of scholarship provides a platform in the explanation of growth in conducting research and being engaged in scholarly learning. My role as a project developer details my leadership roles in managing the various aspects of the project. A presentation of a reflective analysis on my growth as a scholar and practitioner in the development of the project is also provided.

Scholarship

Knowledge of scholarship contributed significantly to my growth and development while I conducted the project study. Scholarship can be defined as researchers engaging original research as a strategy for building bridges between theory and practice and communicating their knowledge effectively to an audience (McBride & Kanekar, 2015). Contemporary reference to the term scholarship is presented by the Carnegie Foundation for the Advancement of Teaching (2013), implying rank in

academia at the college and university level with emphases on research and/or publication. Both definitions of scholarship have influenced my own definition of the terminology. In my experience as a novice researcher, scholarship can be defined as becoming an expert or being knowledgeable in a discipline. My doctoral journey has been impacted by my understanding of the term scholarship to include the four functions of scholarship: discovery, integration, application, and teaching (Boyer, 1990). These components of scholarship created a framework to guide my analysis of the term scholarship.

Discovery. The journey toward completing my doctorate was defined by the quest to make new discoveries along the way. The scholarship of discovery has defined my own journey as a student in higher education while stimulating my inquiry to determine what is to be known and what is yet to be found (McBride & Kanekar, 2015). My discoveries on my doctoral journey have motivated me to look beyond the completion of my doctorate and pursue additional studies in the area of the impact of technology integration on leadership in higher education. The process of discovery climaxed when I conducted the analysis of data, initiating my interests in conducting further research in the area of technology integration. The scholarship of discovery broadened my own concept of inquiry to include the value of integrity and acceptance of social change as elements of the research process.

Integration. The complexity of the multiple experiences I encountered on my doctoral journey forced me to apply the principles of integration in an effort to benefit from those experiences. According to McBride and Kanekar (2015), the scholarship of

integration represents interdisciplinary, interpretive, or integrative responses to new questions and problems. The concept involves giving meaning to isolated facts while making connections and exploring varied perspectives to provide more comprehensive understandings. My own integrated approach to scholarship has influenced my interests in examining different theoretical frameworks that drive the process of technology integration. I have now assumed the responsibility as a scholar to explore diversity by making connections across disciplines in a broader context while maintaining transparency.

Application. One of the main challenges I encountered on my doctoral journey was the consistent application of knowledge to address the problems posed during the program. The scholarship of application is defined by the application of knowledge to address consequential problems and the needs of the world at large, to include service and engagement (McBride & Kanekar, 2015). A determination of the extent to which social problems can define an agenda for scholarly investigation is a question posed at this stage of scholarship. A reflection on this requirement for the scholarship of application has initiated my own search to examine the derivatives of social change in more details. Applying scholarship to create a distinction between undertaking scholarship and simply doing well requires a direct connection between service activities and my expertise (McBride & Kanekar, 2015). My own development as a practitioner is defined by a commitment to professional practices that impacts teaching and learning. As a budding researcher, I am committed to contribute to scholarship that emphasizes the importance of social change to the society.

Teaching. My experiences as a teacher have contributed to the success I have applied to the scholarship of teaching. The latter underlies the ability of the scholar to impart knowledge that can transform the process of learning where active learning and creative thinking can build students' capacity for life-long learning (McBride & Kanekar, 2015). My own commitment to teaching has been characterized by hard work and dedication to scholarship. By completing my doctorate, this commitment would be realized, demonstrating my dedication to professional growth and life-long learning. In my doctoral journey, I will demonstrate the quest to make a difference in the field of technology integration by extending my expertise to the benefit the larger community.

Project Development

During my reflection on the process of designing a professional development program, I was forced to analyze the intricacies involved in the planning and execution of the project. I learned the value of developing a detailed plan that rests on the principles of research, organization, evaluation, and feedback. The characteristics of a structured step-by-step intervention plan and its impact on a professional development program that is implemented successfully caught my attention. During the process of designing the program, I understood the value of developing an action plan geared to apply the principles of problem-solving and project-based learning. The plan to conduct a needs assessment was an important step I anticipated in an effort to collect data to support the existing problem. This process would be followed by selecting an instrument that was reliable and valid, and satisfied the ethical standards required to protect the participants. I also planned to engage the process of formative evaluation during the different

development stages to conduct an assessment of the participants' progress. At the end of the project, an instrument will be administered to conduct the summative evaluation to determine the extent to which the project contributed to the growth and development of the participants in the field of technology integration. I am anticipating that the data collected during the evaluation process will contribute to the body of research existing on the role of technology integration in improving instruction and its impact on social change within the education sector.

Leadership and Change

One of the lessons that I have learnt on my doctoral journey is that leadership and change are important derivatives of scholarship, which often results in positive social change. On this doctoral journey, I have discovered that the relationship between leadership and change is symbiotic, resulting in the transformation of organizations into centers of success (Hechanova & Cementina-Olpoc, 2013). This relationship between leadership and change is a reflection of an institution's culture, its strategies for change, the institution's structure, and the institution itself. The motivation to achieve change was a major incentive toward exploring a topic for this project study. In my own assessment, it would harness my leadership skills, aiding in the accomplishment of the purpose of my practice. My own perceptions of the process of leadership and change reside in the philosophy that change is inevitable, and requires effective leadership in an effort to achieve the desired results. My doctoral experiences forced me to assume the role of a committed leader in the context of assuming the challenges of meeting my established goals including completing my studies.

Executing my role as a leader has provided opportunities to expand my learning experiences while adapting to process and making a difference in my field. In my doctoral experience, I discovered that the initiation of change oriented behaviors may commonly result in the promotion of change, encouragement of innovation, and the facilitation of collective learning (Yukl, 2012). The primary outcome of this initiation resulted in the provision of assistance to others in an effort to improve their capabilities to become successful practitioners. Adopting the use of a learning community as a framework, has fully supported my leadership style which mirrors that of a life-long learner. Learning communities offer opportunities for persons to expand their capacity in achieving the results they desire, nurturing new thinking, exploring collective aspirations, and engendering continuous learning (Hairon & Dimmock, 2012). The concept of learning communities is growing in the field of education, and has benefited the process of teaching and learning by supporting the harnessing of the contributions of participants. My assumption of the leadership role in my learning community has brought into focus my responsibilities as a leader of change, and my developing leadership characteristics as a creative and competent individual.

Analysis of Self as Scholar. Analysis of self as a scholar has revealed my expertise in embracing the qualities of a life-long learner. My journey along the educational ladder is a reflection of my vision to become a scholar in my field. In an effort to achieve academic excellence, I was always motivated to excel at the different levels. While completing my undergraduate and graduate degrees, my passion to excel in the field of education forced me to aspire toward completing a doctoral program.

Achieving this objective will extend my capacity to contribute to the greater good of education by sharing my expertise with others. Accomplishing the standards of a scholar in my field has defined my pursuit of knowledge to serve as a leader in the process transformation, a new demand of professionals in the field of education. Completing my doctoral studies would be a reflection of my commitment to the ongoing development in teaching and learning in higher education.

Analysis of Self as Practitioner. In my experience as an instructor in the field of higher education for over 10 years, my job as an instructional leader has allowed me to embrace innovation and change with a sense of accomplishment. This character has defined the development of my ability to influence the process of teaching and learning through leadership, invention, and vision. The completion of my doctoral journey will strengthen my capacity to impart much of the knowledge, skills, and experiences I have learnt to those with whom I will come in contact. The many courses I completed at Walden University in leadership and other disciplines were quite valuable in building my capacities in critical thinking, scholarship, time management, and research. I am now in a better position as an instructional leader to lobby for meaningful change in the efforts to achieve quality student outcomes in education. I have duly accepted the roles and responsibilities that accompany the expectations of a practitioner, and I am very excited about contributing to the new wave of change sweeping across the field of education.

Analysis of Self as Project Developer. As a project developer, I have embraced the concept of problem solving, based on the application of new knowledge. My experience in the field of project management has assisted me greatly in applying the

skills required to master the hands-on approach required for the problem solving associated with my project study. This experience has exposed me to the fundamentals of project management, both locally and internationally. The role of project developer allowed me to function in the capacity as the instructional leader in the field of technology integration. As the project developer, my responsibilities were extended to operate in the role of a consultant, who provided timely assistance to my colleagues in areas related to technology integration and leadership. I became very excited about this role knowing that the knowledge gained from Walden University contributed to my expertise in project management. My doctoral journey has evolved into building a portfolio of skills and experiences that have inspired me to take on different challenges in the area of teacher education. Therefore, I consider this role to be very influential in the execution of my duties as a reflective project developer. I have humbly embraced this role meaningfully in preparation to contribute an array of solutions needed to address the common problems impacting higher education.

Reflection on Importance of the Work

The findings that evolved from this study indicated that college instructors at the local teacher training college were not integrating technology sufficiently into their curricula. This research was designed as an intervention to explore additional training for the instructors using the TPACK professional development training program. This training program was designed on the use of web -based technologies to address the competencies required by the participants to sufficiently integrate technology into their teaching. The TPACK model allowed for the integration of the technology applications

required to achieve the objectives of the training program. The implementation of a plausible solution to this precise local problem successfully contributed to the accomplishment of a personal goal. It is anticipated that the research developed from this project study may drive the process of best practices in other local teacher training institutions in order to address the stated problem.

This project study is a reflection of several years of hard work, including clarification of the problem, detailed literature reviews, hands-on data collection, qualitative analysis, extensive writing and revising, and presentation of detailed appendices, forming the compilation of a scholarly written dissertation that satisfies the given requirements. I am humbled by the outcomes of this case study and the resulting comprehensive professional development training program designed. I share the view that the continuous implementation of the TPACK professional development training program will go a far way in adequately preparing instructors to successfully integrate technology into their curricula. I am very optimistic about the possibility of the training program being adopted as a part of the re-designing of the teacher education training program in the training of teachers in using ICTs in Jamaica and the Caribbean.

The Project's Potential Impact on Social Change

In recent times, higher education institutions have paid serious attention to the use of technology in their daily operations in an effort to achieve efficiency and effectiveness. The contribution of faculty to this process of change has been significant in defining the success of these organizations. The application of the TPACK model to address weaknesses in technology integration among instructors has brought into focus the level

of support these participants require in their pedagogical practices. The impact of common barriers to technology integration on its implementation by instructors has negatively affected the efforts of these participants to achieve success. Barriers often prevent instructors and their students from fully capitalizing on the benefits of technology integration (Wachira & Keengwe, 2011). The outcomes of this study have emphasized the need for quality support to be provided through professional development, which will strengthen the competences of the participants who face these barriers. Professional development should be viewed as mandatory for instructors implementing technology integration in an effort to achieve meaningful success.

To effectively support the participants' efforts in the implementation of technology integration, the TPACK professional development model has outlined the trajectory necessary to accomplish such support. The application of TPACK as an intervention is a welcomed effort in the environment of aggressive pursuit for solutions to achieve seamless integration of technology into the curriculum. Despite the meaningful interventions of investments in technology infrastructure, equipment, and professional development, technology integration has not produced encouraging results (Buabeng-Andoh, 2012). The TPACK model for professional development proposed in this project study has the characteristics to successfully transform the participants into competent practitioners in the area of technology integration. The participants who joined the professional development workshops have demonstrated the importance of modern pedagogical and technological training. Such intervention can initiate a new paradigm in technology integration among instructors.

The global impact of the TPACK model-driven professional development training is a testament of its effectiveness in successfully addressing the weaknesses instructors exhibited while integrating technology into their lessons. The benefits of the project transcend the local institutions to maximize their reach within the global community of higher education. The outcomes of the professional development training have the potential to bridge the existing technology gap in teaching and learning at the higher education level (Buabeng-Andoh, 2012). Graham (2011) suggested that the TPACK model creates a strong foundation that motivates participants to be persistent in integrating technology in their curricula. This has resulted in the instructors becoming instructional leaders who pilot the process of integrating technology into their disciplines.

The institution will benefit from the presence of additional expertise in the areas of technology integration and leadership. This expertise could be shared with other teacher-training institutions with the object of building best practices among these institutions. My own participation in this process could contribute to the seamless integration of these best practices into the teacher-training curriculum at institutions in my locality. This involvement could include sharing my experiences with my family in an effort to broaden their perspectives of the dynamic changes taking place in teacher education and the field of education generally.

Implications, Applications, and Directions for Future Research

In conducting my frequent ongoing reflections on my doctoral journey, I was always excited by the numerous opportunities provided by Walden University to apply skills such as critical analysis and problem solving as a practitioner. The application of

these and other skills during my project study brought into focus a new perspective on the rigors of research and its value on my own contributions to such investigation. The implications for further research on exploring instructors' integration of technology in their curricula should produce results that prepare institutions to effectively undertake interventions while addressing the problem. My suggestion that this project study should become a model for guiding institutions with similar challenges is consistent with previous research. Further research on comparing the impact of the TPACK model for technology integration with other models such as the TAM could be explored to analyze the larger impact of the TPACK model.

The role of the administrations in the implementation of technology integration should be clearly examined in an effort to maximize the required support for instructors participating in the process. Technology leadership offered by the administrators of institutions should reflect commitment to dedicated support for technology integration through the establishment of partnerships with relevant stakeholders (Weng & Tang, 2014). Forging these partnerships will provide a medium for the initiation and sustainability of technology integration as an important intervention used by teachers to achieve established student learning outcomes. Further research, therefore, becomes the catalyst for concretizing the necessary support required by instructors to successfully integrate technology into their curriculum.

It is anticipated that the TPACK professional development training program will create an impact on teacher training by serving as a guide to instructors in the development of their competencies in the areas of technology integration. The

effectiveness of the implementation of this program strongly rests on ongoing research in the area to maintain the sustainability of the training program and its delivery. Efforts by administrators and leaders in higher educational institutions to foster further research on the program in their institutions could go a far way in promoting the use of the TPACK model professional development training program as a tool to assist instructors to integrate technology.

The impact of further research could establish best practices in the form of methodologies adopted in teacher training curricula. These methodologies would address critical areas, such as integrating appropriate technology tools, the adoption of effective pedagogy, and recommendations for suitable materials and equipment, required to achieve successful technology integration. The implementation of these measures could create a huge impact on the new paradigm now evolving in teacher training where the integration of technology is gradually becoming critical to classroom operations (Garner & Bonds-Raacke, 2013). Such implications are important in addressing the wider concerns related to the shortcomings of student achievement in the classroom.

Conclusion

In this section, I have presented a detailed description of the analysis of my reflections on the strengths of the TPACK professional development model, and description of its limitations in addressing the problem. Included in this presentation are the recommendations for addressing the research from a different perspective, a reflective analysis on scholarship, the project developer, and the practitioner. The impact of leadership and change is quite dominant throughout the presentation. This is as a result of

the direct influence of the exposure provided by the Walden University courses that I pursued. The outcome of these experiences concretized the importance of these concepts and their applications to the results of my project study.

The impact of the project on the sustainability of technology integration in higher education is also brought into focus. The importance of the TPACK professional development model to the revolution of pedagogy in the classroom is one main implication of the project mentioned in this section. Areas for possible research are also included in this section to initiate further exploration of the topic. Section 4 of this study fully captured a comprehensive reflection on the completing of the study in the form of an analysis from my perspective as novice researcher. In anticipation of the completion of my doctoral journey, I have fully embraced my responsibilities as a scholar, practitioner, and project developer—one who is fully prepared to make a difference in the field of education. Through the experiences I have gained while completing this project, I have adopted the value of social change and embraced the importance of leading the change process in my discipline in an effort to make a difference. Finally, the overall presentation of this section pulls together the outcomes of my efforts as a novice researcher to make a positive impact in the fields of technology integration, leadership, and education.

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Appendix A: Technology Integration Workshop

The World of Technomania

Schedule - 2016

Day 1

9:00 a.m.	Introduction of facilitator, director of curriculum unit, librarian, and system administrator outline of expectations
9:30 a.m.	Introduction to MoodleLE
10:30 a.m.	Morning Break
10:45 a.m.	Introduction of Wikis
NOON	LUNCH
1:15 p.m.	Designing of Wikis
3:00 p.m.	ADJOURNMENT

Day 2

9:00 a.m.	Review of previous day's activities
9:30 a.m.	Introduction to e-Blogger
10:30 a.m.	Morning Break
10:45 a.m.	Presentation by librarian on the e-library
11: 15 a.m.	Introduction of Webquests
NOON	LUNCH
1:15 p.m.	Designing of Webquests
3:00 p.m.	ADJOURNMENT

Day 3

9:00 a.m.	Review of previous day's session
9:30 a.m.	Introduction to Smart Board

10:30 a.m.	Morning Break
10:45 a.m.	Introduction to Prezi
NOON	LUNCH
1:15 p.m.	Designing of Prezi
3:00 p.m.	ADJOURNMENT

Day 4

9:00 a.m.	Review of previous day's session
9:30 a.m.	Presentation by director of curriculum unit on standards related to the design of lessons
10:30 a.m.	Morning Break
10:45 a.m.	Principles associated with designing interactive technology-enriched lessons
NOON	LUNCH
1:15 p.m.	Designing technology-enriched lessons
3:00 p.m.	ADJOURNMENT

Day 5

9:00 a.m.	Review of previous day's activities
9:30 a.m.	Presentation of guidelines for presentation and introduction of the evaluation team
10:30 a.m.	Morning Break
10:45 a.m.	Beginning of presentations
NOON	LUNCH
1:15 p.m.	Continuation of presentations
2:30 p.m.	Feedback from evaluation team
	WRAP UP
3:00 p.m.	ADJOURNMENT

Junior Martin

TECHNOLOGY INTEGRATION WORKSHOP

THE WORLD OF TECHNOMANIA

PURPOSE

The professional development workshop is proposed as a rational solution to adequately address the instructors' inability to successfully integrate technology into their content area in an effort to improve their pedagogy. The intense workshop will last for five days, and will be designed to provide instructors with training in areas, such as the use of technology applications and tools, and modern methodologies, to improve technology integration.

GOALS

By the end of the professional development workshop, the instructors will be able to:

1. improve their competencies in the integration of technology into their specific content areas;
2. become empowered as competent practitioners to integrate technology into the design and execution of their lessons;
3. design lessons using modern web-based tools; and
4. develop the competencies to use the SMART Board to integrate their lessons.

LEARNING OUTCOMES

By the end of the professional development workshop, the instructors will be able to:

1. design technology-rich lessons using web-based and other modern resources;
2. use MOODLE LMS as a tool to design lessons;
3. develop Wikis, Blogs, and WebQuests using topics from their content areas;
4. use Prezi to design lessons;
5. use the features of the SMART Board to present their lessons; and
6. design an interactive lesson integrating all the web-based tools.

TARGET AUDIENCE

The audience is a group of college instructors , hereafter referred to as participants, from the Social Sciences Department of the institution. They are highly experienced with an average of 10 years' teaching experience in higher education. All the participants hold master's degrees with two holding doctoral degrees and three currently pursing their doctorates. They are past students of the institution.

WHY TECHNOMANIA?

"We need technology in every classroom and in every student and teacher's hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world." – DAVID WARLICK

OBJECTIVES OF PROJECT

- To create a professional development program to address weaknesses associated with the participants' attempts to integrate technology into their content areas
- To empower the participants to integrate technology seamlessly into their lessons
- To build a culture of collaboration, expertise, and professionalism among the participants

PROJECT IMPLEMENTATION

- The participants will be engaged in a five-day intensive workshop.
- Each day will target the integration of specific technology tools into the curriculum
- On the final day, the participants will present technology-enriched lessons developed during the workshop

COMPONENTS OF THE PROGRAM


DAY
ONE

DAY 1

- Introduction of Facilitator
- Introduction of Director of Curriculum Unit
- Introduction of System Administrator
- Overview of Workshop by Facilitator
- Presentation of MOODLE Page
- Designing of Wiki using Wix.com

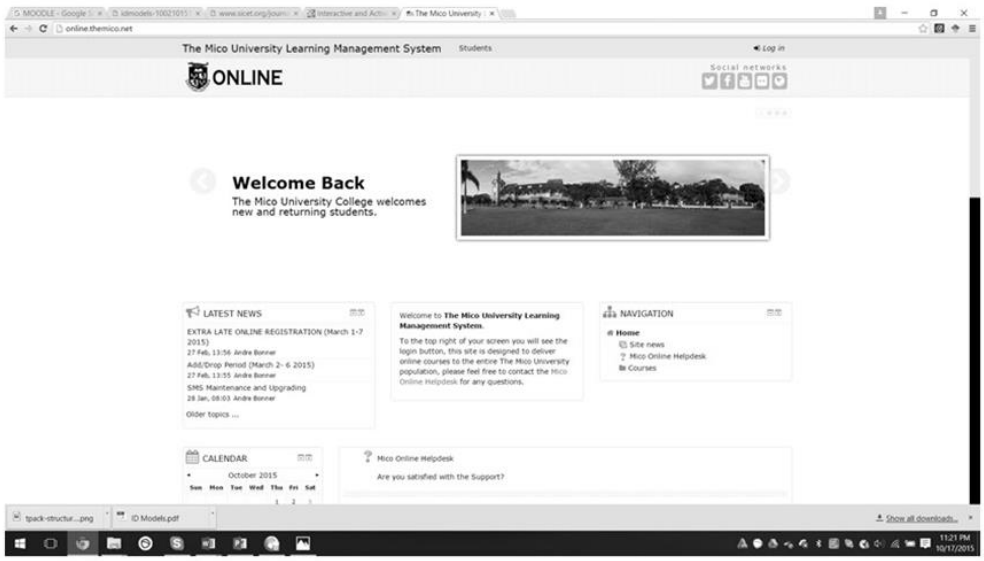
INTRODUCTION OF PROJECT ACTIVITIES

- Presentation of Facilitator, Director of Curriculum Unit and System Administrator
- Expectations of Instructors
  - Attending workshop on time
  - Bring required resources
  - Consulting the MOODLE page before and during sessions
- Overview of Workshop
  - Presentation of the goals and purpose of workshop
  - Introduction of resources

ACTIVITY 1(USING MOODLE)

The participants will be introduced to the MOODLE LMS. They will be required to log into the resource using the required credentials. The facilitator will demonstrate the steps required to manipulate the key features. The MOODLE tutorial will be introduced to the participants. Following the presentation, the participants will use the editing function to manipulate the main features of MOODLE. They will add a welcome note, description, specific activities, and resources (discussion, assignment, files, forum, URLs, etc.).

INTRODUCING MOODLE



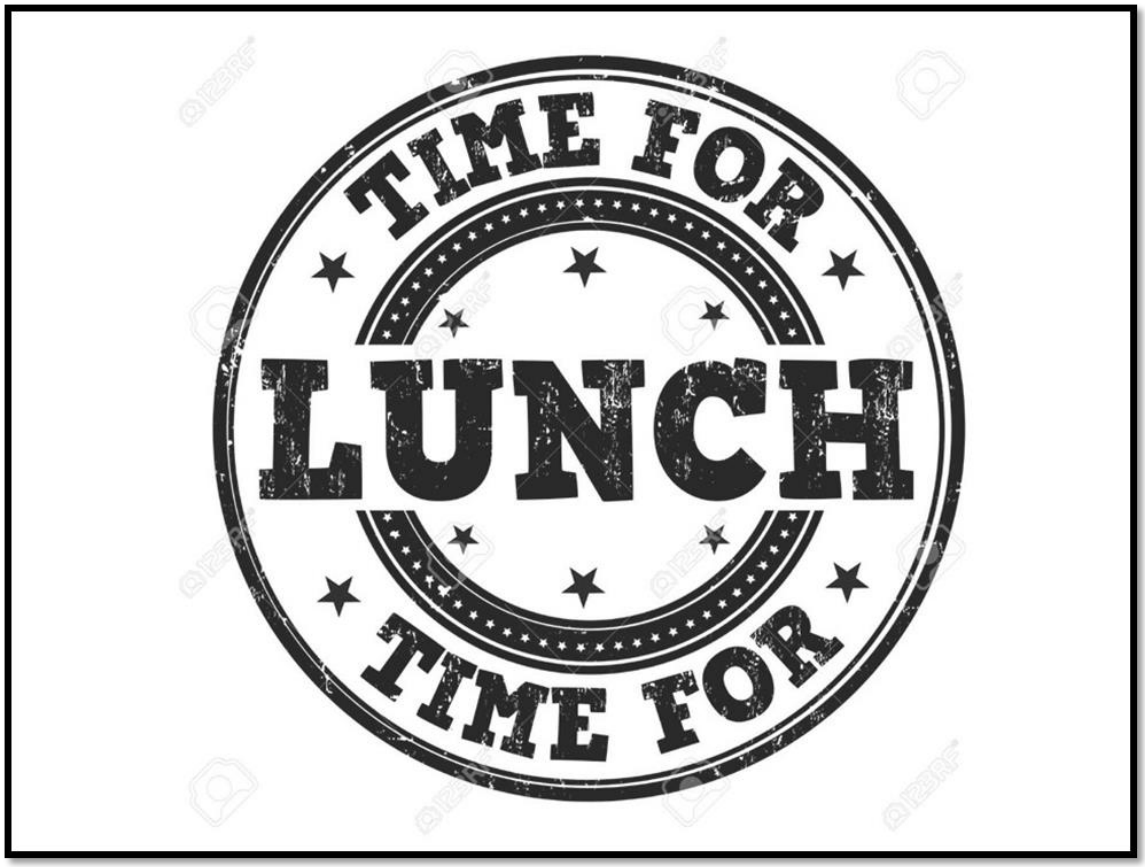
MOODLE TUTORIAL

All the Videos on Using MOODLE


The
Morning
Break

INTRODUCTION OF WIKIS

Participants will be introduced to the class Wiki. They will be introduced to the class Wiki, “Technomania”.


TIME FOR
LUNCH
TIME FOR

ACTIVITY 2 (DESIGNING A WIKI)

Participants will view a video entitled "Educational Uses of Wikis". This will be followed by a discussion on how to use Wikis in designing lessons. The participants will be divided into groups to design their own Wikis. They will use the tutorial entitled "Designing a Wiki" to develop their own Wikis.

DESIGNING A WIKI

Introducing wix.com

Tutorials

ADJOURNMENT


Day
2

REVIEW OF DAY 1 ACTIVITIES

- Review of the main features of MOODLE
- Review of the main features of Wikis
- Review of the Wikis completed by the different groups

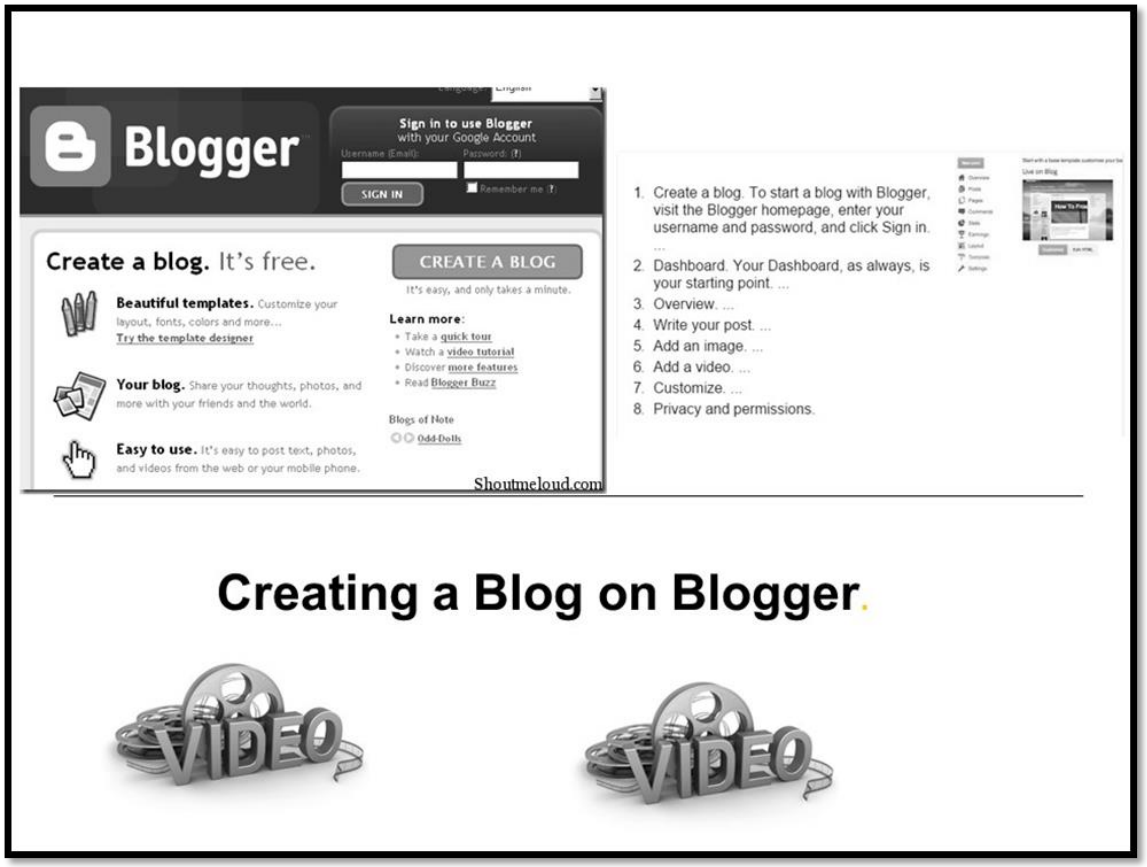
ACTIVITY 3 (CREATING BLOGS)

The activity will be introduced with an article entitled "Blogs in Education". Participants will discuss the value of using Blogs in lessons. In their groups, the participants will use the tutorial provided to create a Blog by following the steps:

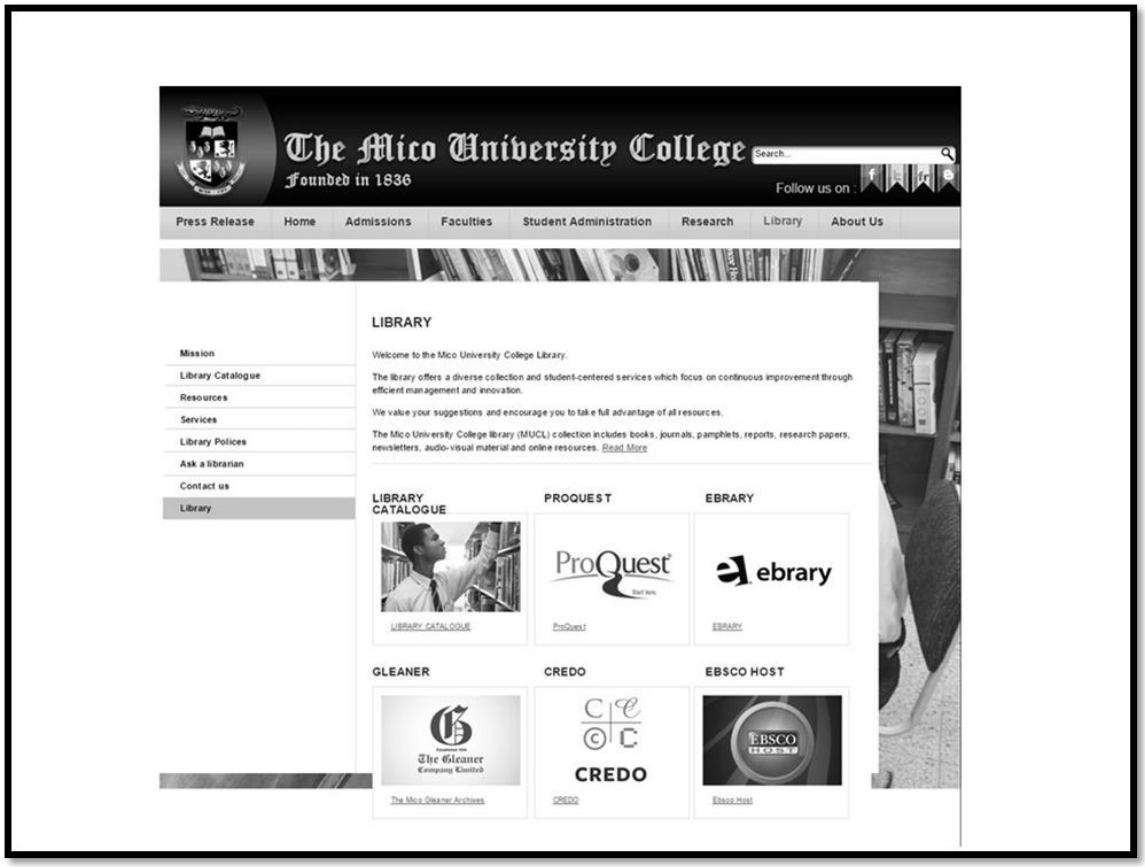
1. Create the account .
2. Name the blog (choose a title for the blog, develop the URL).
3. Select template.
4. Preview and customize template.
5. Create and refine message.
6. Publish message.
7. Invite persons to join your Blog.

•They will consult the tutorial "Designing a Blog" while they design their Blog.

•They will critique each other's Blogs based on the criteria given.


Blogger
Sign in to use Blogger
with your Google Account
Username (Email):
Password:
SIGN IN
Remember me
Create a blog. It's free.
CREATE A BLOG
It's easy, and only takes a minute.
Beautiful templates. Customize your layout, fonts, colors and more...
Try the template designer
Your blog. Share your thoughts, photos, and more with your friends and the world.
Easy to use. It's easy to post text, photos, and videos from the web or your mobile phone.
Learn more:
Take a quick tour
Watch a video tutorial
Discover more features
Read Blogger Buzz
Blogs of Note
Odd-Dolls
Shoutmeloud.com
1. Create a blog. To start a blog with Blogger, visit the Blogger homepage, enter your username and password, and click Sign in. ...
2. Dashboard. Your Dashboard, as always, is your starting point. ...
3. Overview. ...
4. Write your post. ...
5. Add an image. ...
6. Add a video. ...
7. Customize. ...
8. Privacy and permissions.
Creating a Blog on Blogger.
VIDEO
VIDEO


The
Morning
Break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EBRARY
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GLEANER
CREDO
EBSCO HOST
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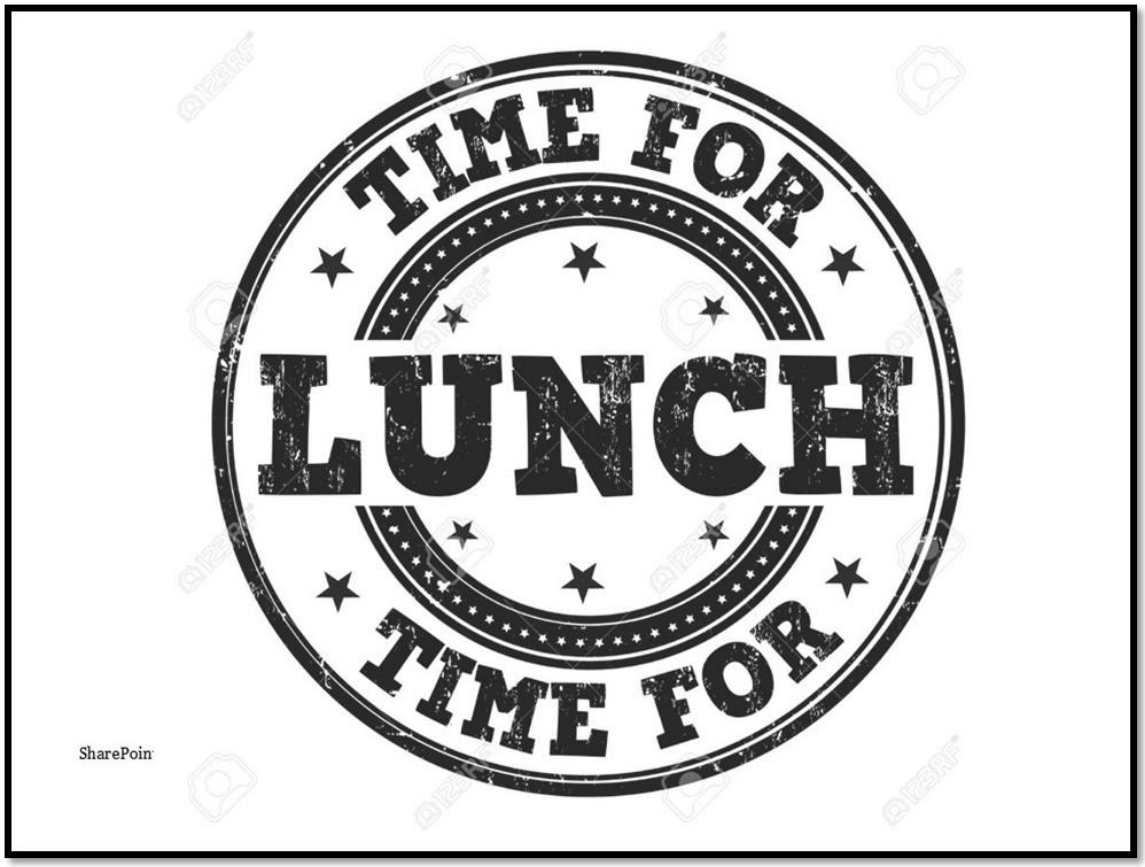
CREDO
Ebsco Host


TIME FOR
LUNCH
TIME FOR
SharePoin

ACTIVITY 4 (DESIGNING WEBQUESTS)

The participants will discuss the educational benefits of WebQuests. Following the discussion, the participants will view a video entitled "Online WebQuest Creator." In their groups, they will deign a WebQuest. They will also develop an instructional development plan for the implementation of the WebQuest they designed.

DESIGNING WEBQUESTS

zunal.com

Online Webquest Creator

Video

WebQuest taxonomy
http://projects.edtech.sandi.net/staffdev/tpss99/tasksimap/
"The student WebQuest - A productive and though provoking use of the Internet" by Maureen Brown Yoder (1999)
http://www.lesley.edu/faculty/myoder/webquest.pdf
"Five Rules for Writing a Great WebQuest" by Bernie Dodge (1995) http://www.mapacourse.com/webquestproject/focus_rules.pdf

ADJOURNMENT


DAY
03

REVIEW OF DAY 2 ACTIVITIES

- Review of Blogs
- Review of e-Library resources
- Review of the WebQuests completed by the different groups

ACTIVITY 4 (USING THE SMART BOARD)

The participants will be introduced to the main features of the SMART Board by the presenter. In small groups, they will demonstrate the features of the SMART Board. Participants will use the tutorial entitled "SMART Board Tutorial" and determine how they can use the SMART Board in their teaching activities.

THE INTERACTIVE SMART BOARD

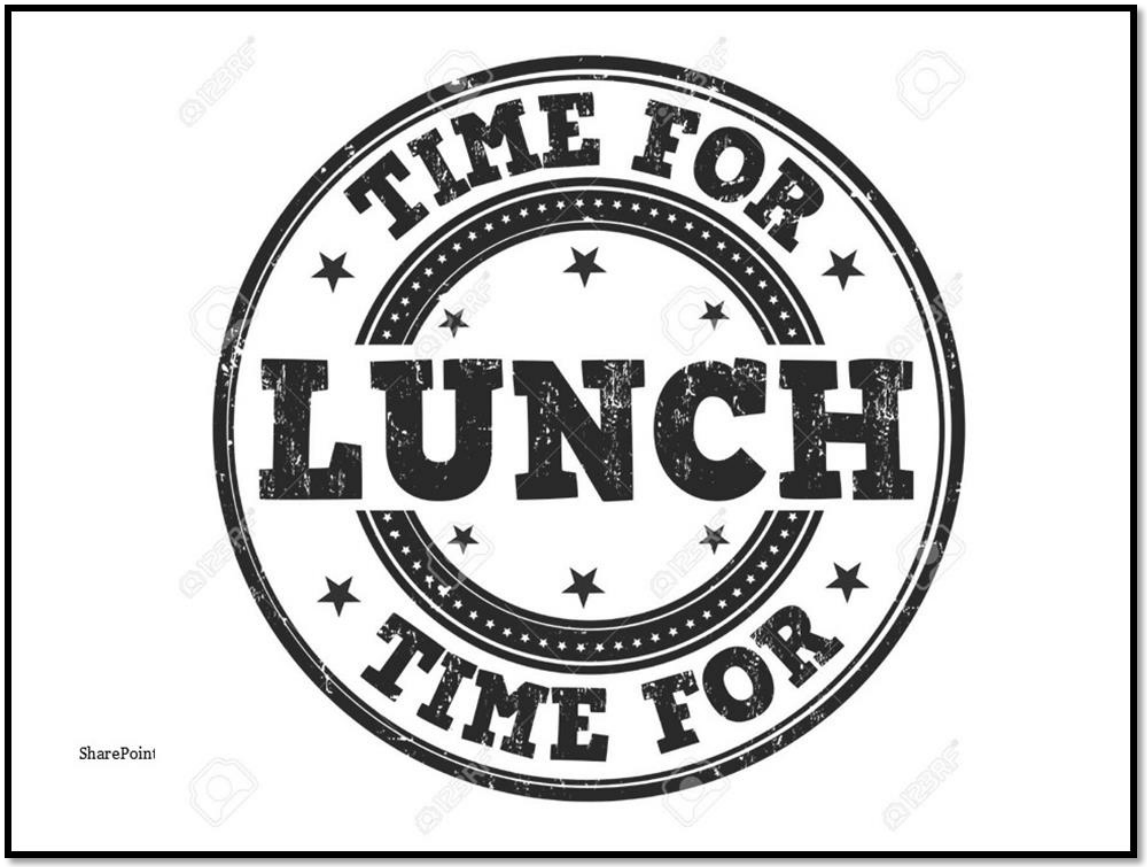
The **Smart Board** is an interactive whiteboard that uses touch detection for user input (for example scrolling and right mouse-click) in the same way as normal PC input devices. The **Smart Board** 800 series interactive whiteboard introduced a 'flick and scroll' feature.

Interactive SMART Board Tutorial


The
Morning
Break

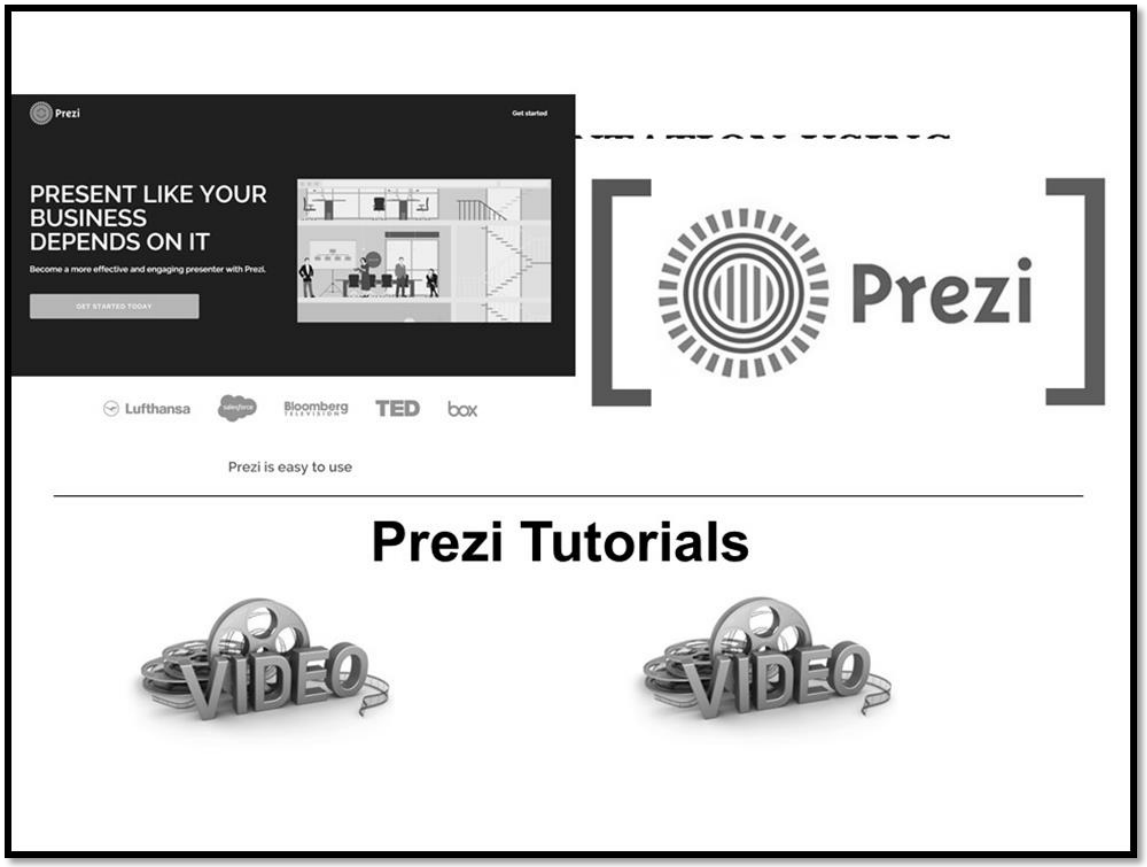
INTRODUCTION OF PREZI

- Facilitator will introduce Prezi to the participants.
- Demonstration of the main features of Prezi.
- Presentation of Prezi designed by facilitator.


TIME FOR
LUNCH
TIME FOR
SharePoint

ACTIVITY 5 (USING PREZI)

The participants will access the different videos on how to design a Prezi. In their groups, the participants will design a Prezi. The different groups will share their Prezi and do a critique of the design of the resource and assign a score.


Prezi
Get started
PRESENT LIKE YOUR BUSINESS DEPENDS ON IT
Become a more effective and engaging presenter with Prezi.
GET STARTED TODAY
Prezi
Lufthansa
Bloomberg
TED
box
Prezi is easy to use
Prezi Tutorials
VIDEO
VIDEO

ADJOURNMENT


DAY
4

REVIEW OF DAY 3 ACTIVITIES

- Review of features of SMART Board
- Review of Prezi presentations completed by groups

STANDARDS FOR DESIGNING INTERACTIVE LESSONS

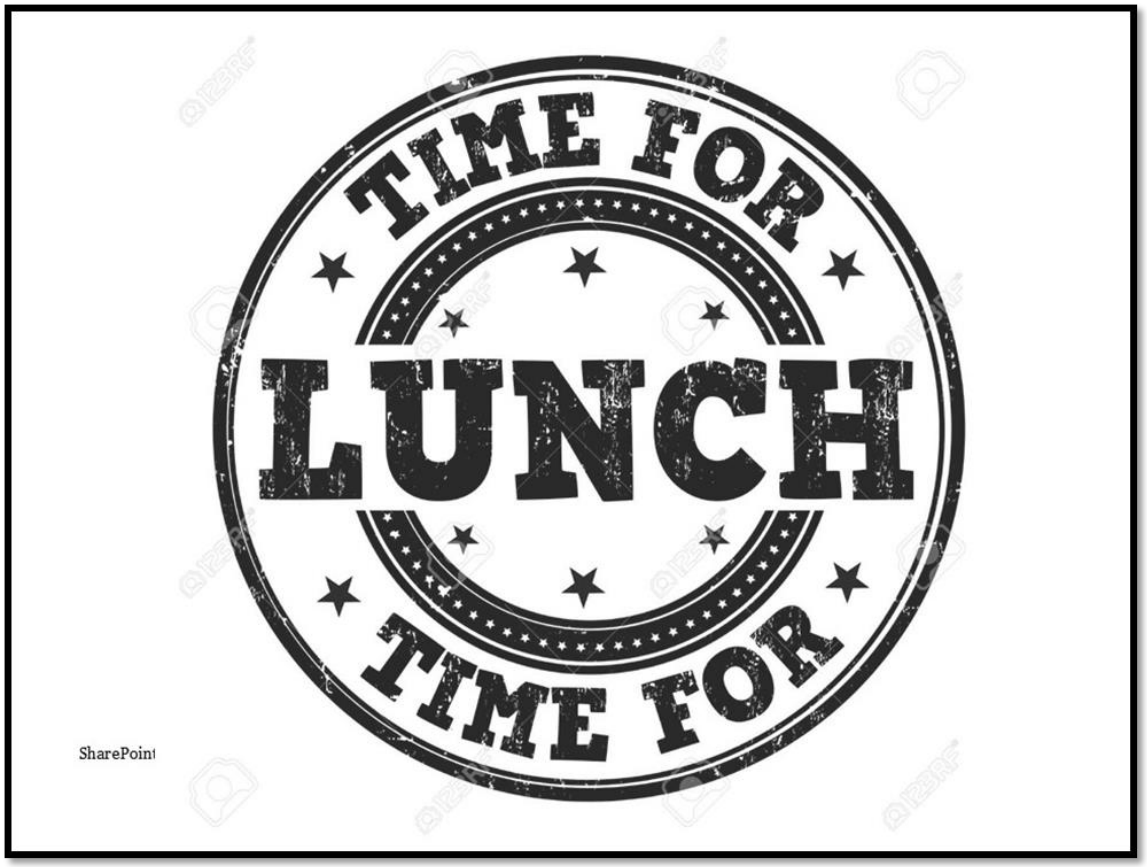
Standards required by the University Council of Jamaica (UCJ), the accrediting body in Jamaica.

- The institution's/program's statement of scope and purpose as compared with conditions that are believed to be necessary and desirable to produce educational quality.
- There is sufficient evidence that the program does achieve the stated outcomes.
- Institutional integrity exists, that is, determination that the program is in fact what it says it is and does what it says it does.
- The student learning outcomes specify that the learner is expected to know, understand and be able to do.
- The student learning outcomes are appropriate to the purpose of the program, the discipline, and the level of the program.


The
Morning
Break

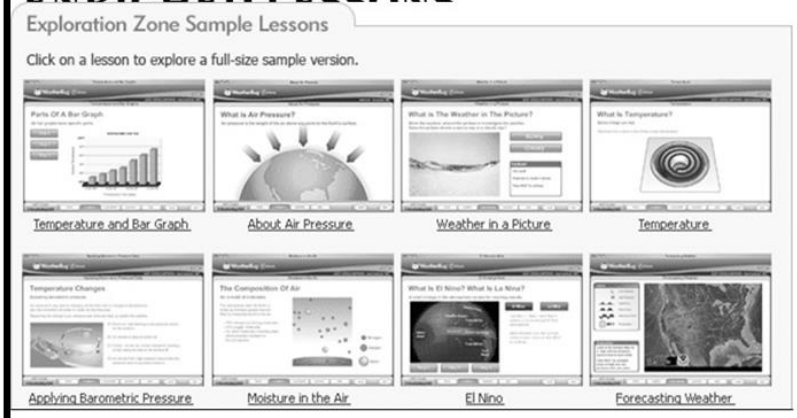
ACTIVITY 6 DESIGNING TECHNOLOGY-ENRICHED LESSONS

The participants will be introduced to the principles of Instructional Design. Following the interaction with resources on Instructional Design, Learning Theories, Design Models and the TPACK Model (videos and websites), the participants will begin to design an integrated lesson in their groups. They will be required to use all the web-based tools to design the lessons.


TIME FOR
LUNCH
TIME FOR
SharePoint

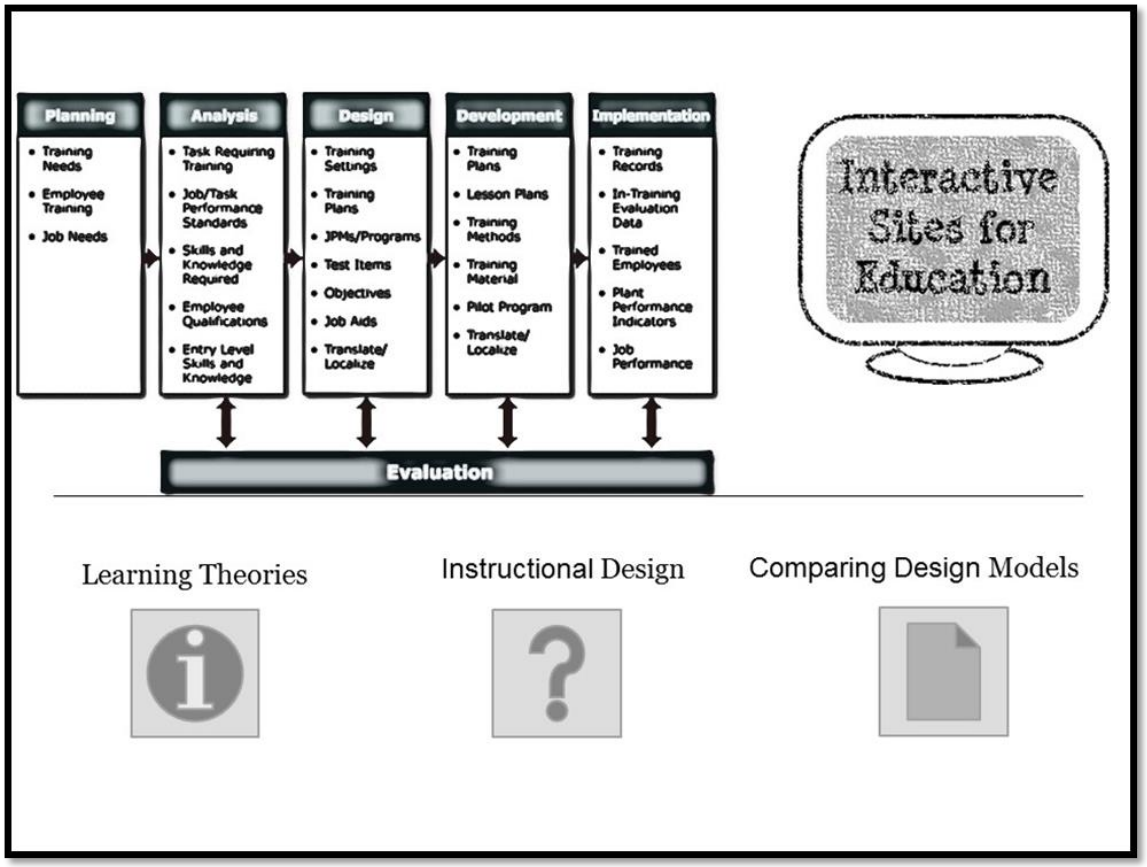

WE'RE
BACK!

DESIGNING INTERACTIVE TECHNOLOGY-ENRICHED LESSONS

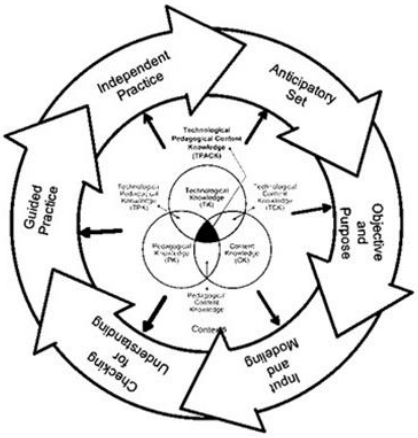


Resources

- Web tools for creating interactive lessons and presentations
- Making lessons dynamic
- Creative interactive learning environments
- Interactive Activities


Planning
• Training Needs
• Employee Training
• Job Needs
Analysis
• Task Requiring Training
• Job/Task Performance Standards
• Skills and Knowledge Required
• Employee Qualifications
• Entry Level Skills and Knowledge
Design
• Training Settings
• Training Plans
• JPMs/Programs
• Test Items
• Objectives
• Job Aids
• Translate/ Localize
Development
• Training Plans
• Lesson Plans
• Training Methods
• Training Material
• Pilot Program
• Translate/ Localize
Implementation
• Training Records
• In-Training Evaluation Data
• Trained Employees
• Plant Performance Indicators
• Job Performance
Evaluation
Interactive Sites for Education
Learning Theories
Instructional Design
Comparing Design Models

THE TPACK MODEL



What is TPACK?

TPACK and more

TPACK simplified

ADJOURNMENT


DAY 5

REVIEW OF DAY 4 ACTIVITIES

- Review of standards Required to design technology-enriched lessons
- Review of principles necessary for designing technology-enriched lessons

GUIDELINES FOR FINAL ACTIVITY

1. In your groups, select a topic from your content area and design an interactive lesson demonstrating the integration of technology. Include at least 4 of the resources you were exposed to during the training. Please ensure that the principles of instructional design and resources from e-library are included, and the lesson is taught using the SMART Board.
2. Each member in a group MUST justify his or her contributions towards the outcome of the final product by writing a reflection on the activity.

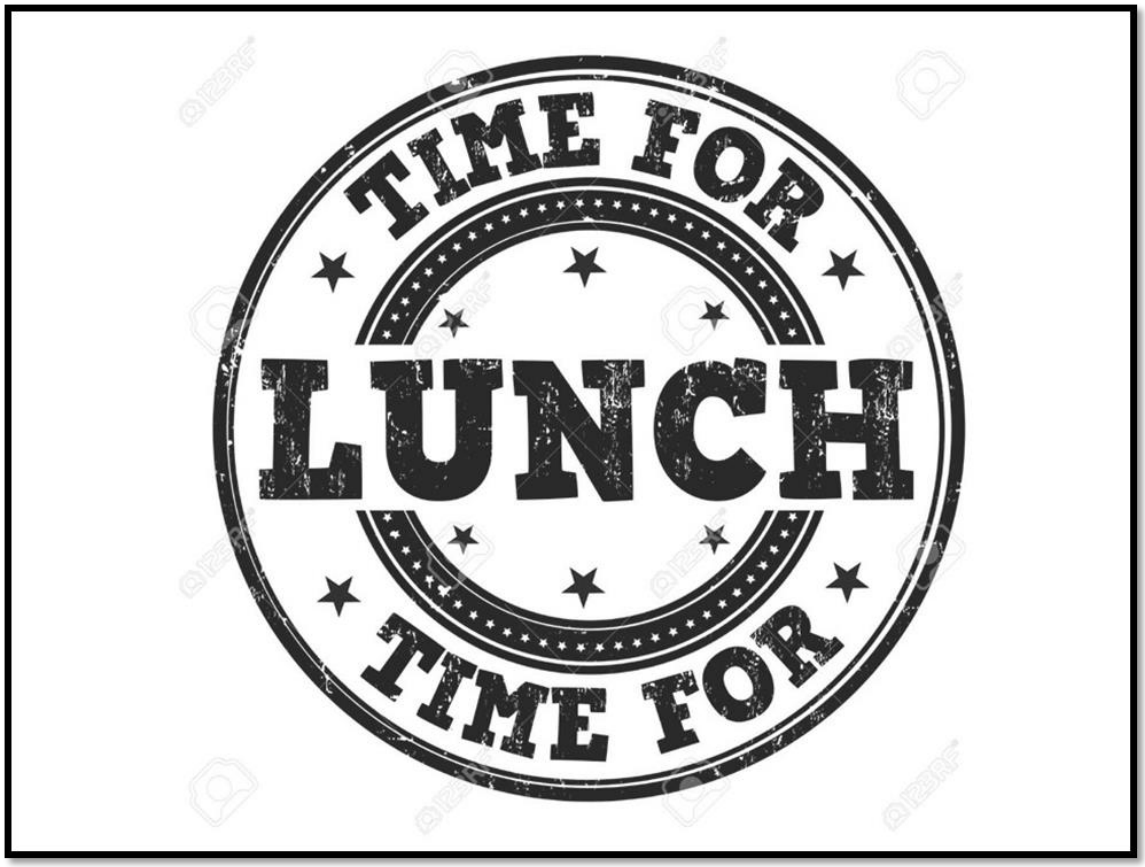
GUIDELINES FOR FINAL ACTIVITY CONT'D

- Include at LEAST 4 higher order objectives in your plan.
- Design at LEAST 4 activities using different web-based resources in your lesson.
- The assessment for the lesson should include the use of an interactive application.
- Present your lesson using PowerPoint or a Wiki.


The
Morning
Break

ACTIVITY 7 (DESIGNING A MODEL LESSON)

The final activity of the workshop will feature the participants designing a model lesson using the knowledge gained from their exposure in technology integration. Using a design model, the participants will design a technology-enriched lesson demonstrating the integration of at least 3 web-based tools. This activity will be evaluated to determine the extent to which the participants understand the concept.


TIME FOR
LUNCH
TIME FOR

CONTINUATION OF PRESENTATIONS
&
WRAP UP EXERCISE
(ADMINISTRATION OF QUESTIONNAIRE)

WRAP UP

1. Give 2 examples of the importance of using the instructional design model when designing interactive lessons?
2. How can teachers use Blogs creatively in their lessons?
3. Choose a web-based resource to which you were exposed during the training and explain how you might use it to teach an abstract topic in your content area.
4. Compare and contrast a presentation done by PowerPoint and another done by Prezi.
5. Did the training meet your expectations? Give reasons for you answer.
6. How could the training program be more effective in an effort to meet its objectives?

MATERIALS FOR WORKSHOP

MATERIALS

1. Tutorial on MOODLE LMS
   - https://moodletutorialsforteachers.wikispaces.com/

2. Website Designed for Workshop
   - http://juniormartin9.wix.com/technomania

3. Wiki Tutorials
   - https://www.youtube.com/watch?v=WRU83c06luM
   - https://www.youtube.com/watch?v=sd0grLQ4voU

4. Blog Tutorials
   - https://www.youtube.com/watch?v=Oiov0L4blIw
   - https://www.youtube.com/watch?v=l76e3Y8ZFdA

MATERIALS CONT'D

5. WebQuests Tutorials

- https://www.youtube.com/watch?v=f8CaPbCE5MI
- https://www.youtube.com/watch?v=3ckRFl70lZM

6. Interactive SMART Board Tutorial

- https://www.youtube.com/watch?v=Ei0yiZq-EEg&list=PLDB82588A2B0440F9

7. Prezi Tutorial

- https://www.youtube.com/watch?v=ArGh6FurR0Q
- https://www.youtube.com/watch?v=inH_CN7phjk

MATERIALS CONT'D

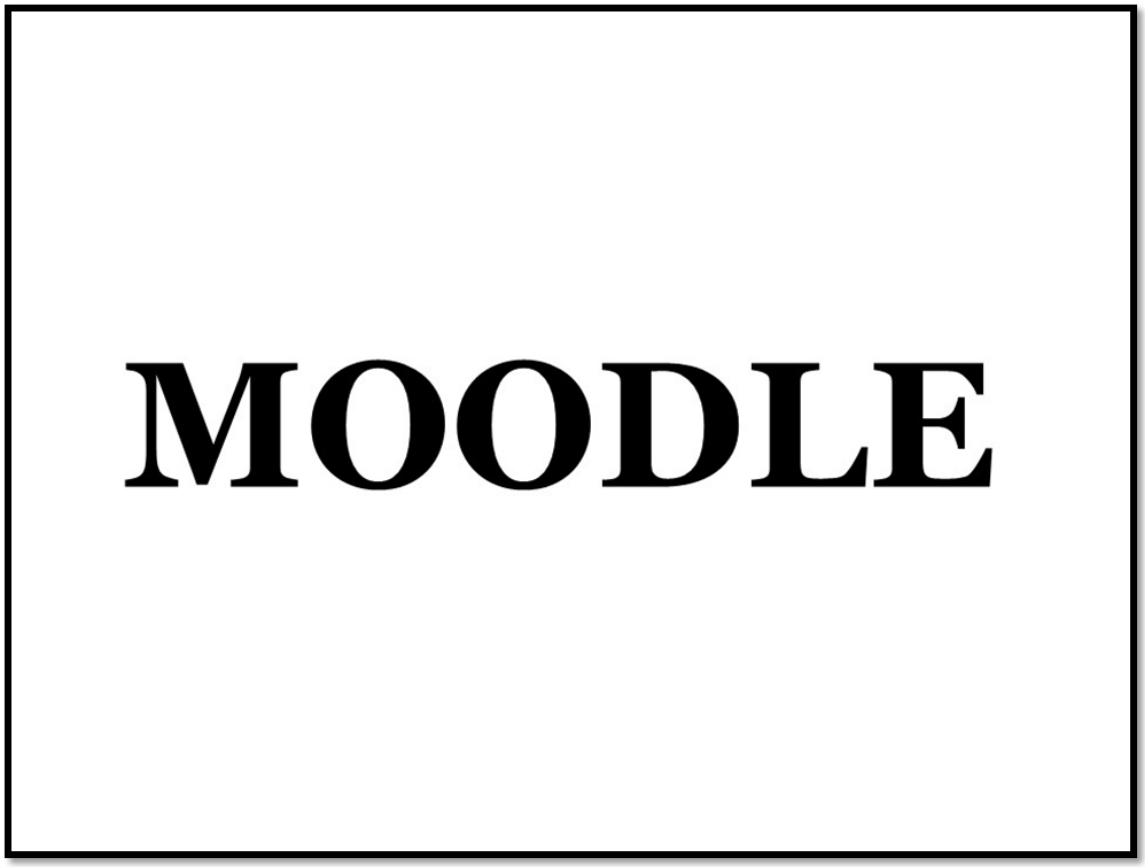
8. Resources for Designing Interactive Lessons

- http://www.educatorstechnology.com/2014/05/5-good-web-tools-to-create-interactive.html
- http://www.bbcactive.com/BBCActiveIdeasandResources/Tenwaystomakelecturesmoredynamic.aspx
- http://serc.carleton.edu/NAGTWorkshops/online/interactive.html
- https://www.youtube.com/watch?v=DtLWviqqAXU

9. Resources for Final Session of Workshop

- http://www.nwlink.com/~donclark/hrd/learning/development.html
- http://www.lifecircles-inc.com/Learningtheories/learningmap.html
- http://wiki.ubc.ca/images/a/ae/ID-model.pdf

TRAINER NOTES

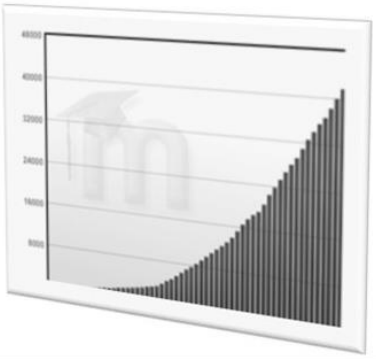

MOODLE

WHAT'S IN A NAME?

- Modular Object Oriented Dynamic Learning Environment
- A verb that describes the process of lazily meandering through something, doing things as it occurs to you to do them, an enjoyable tinkering that often leads to insight and creativity
- Anyone who uses Moodle is a Moodler

ABOUT MOODLE

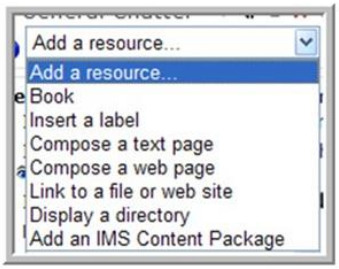
- Is an active and evolving work in progress
- Started in the ’90s, first released in 2002
- Moodle.org user community
- Moodle.com company website
- Moodle Stats as of June 16, 2008:
  - 45,271 registered sites in 199 countries
  - 1,985,661 Courses
  - 20,535,286 Users
  - 1,912,476 Teachers



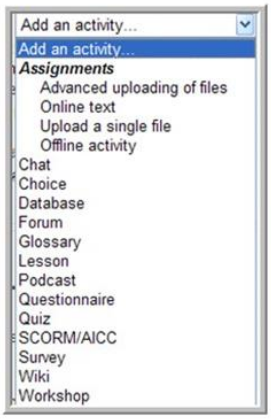
MOODLE: RESOURCES & ACTIVITIES

- Moodle gives you two types of items to add.
- Resources are things for students to look at or read.
- Activities are things for students to do.

Moodle Resources



Moodle Activities →



MOODLE: REPORTS

- WOW, WOW, WOW!!!
- Can see details about every click made.
- Can sort, filter and view in greater detail.

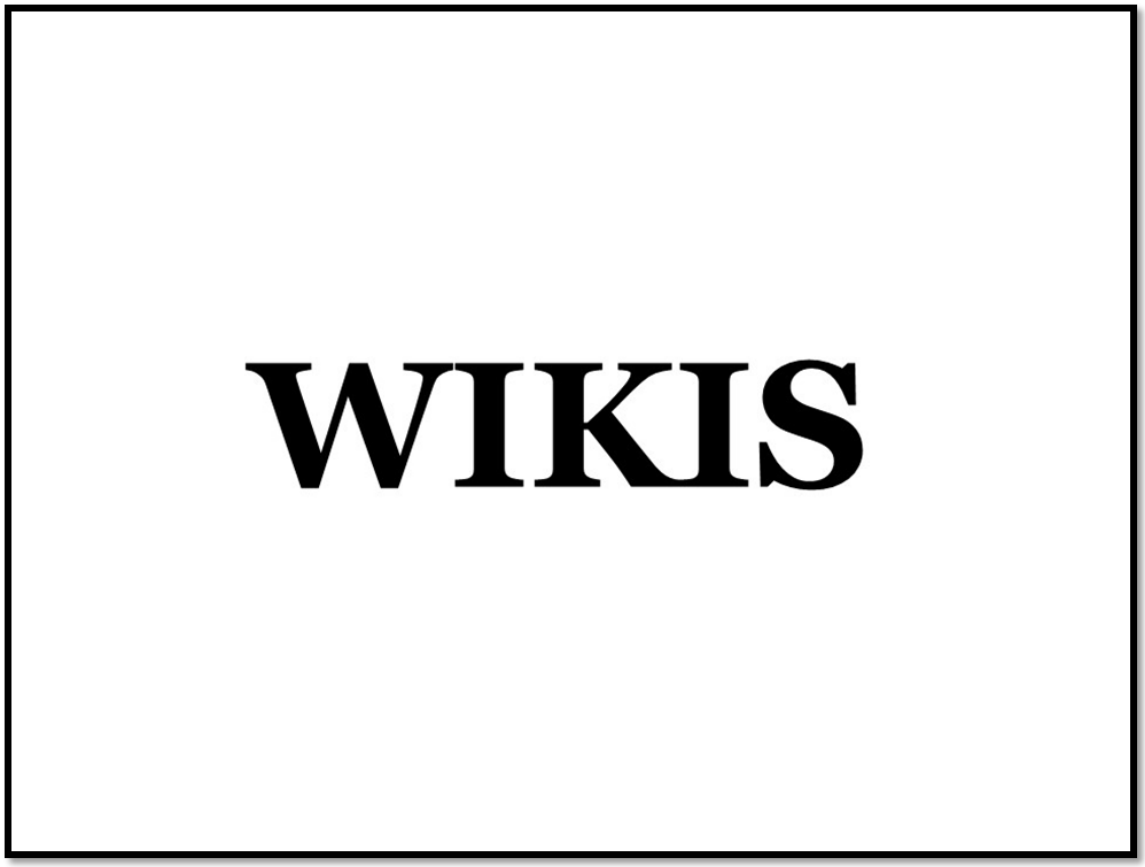
Reports screen

Time	IP Address	Full name	Action	Information
Mon February 4 2008, 12:35 PM	152.34.87.104	Tina Farmer	course report log	CIS111_TFarmer_IN_A
Mon February 4 2008, 12:35 PM	152.34.87.104	Tina Farmer	course report live	CIS111_TFarmer_IN_A
Mon February 4 2008, 12:27 PM	152.34.87.104	Tina Farmer	course view	CIS111_TFarmer_IN_A
Mon February 4 2008, 12:26 PM	75.110.15.69	Caroline Monsen	assignment view	Campus Cruiser Scavenger Hunt
Mon February 4 2008, 12:24 PM	75.110.15.69	Caroline Monsen	assignment view	Campus Cruiser Scavenger Hunt
Mon February 4 2008, 12:23 PM	75.110.15.69	Caroline Monsen	quiz view	Module 1 Test
Mon February 4 2008, 12:14 PM	75.110.15.69	Caroline Monsen	assignment view	Module 1 Project

MOODLE: MESSAGE

- A hybrid between instant messaging and email.
- If a student is online, when you send a message an instant message box alerts them to your message immediately.
- If they are not online an email is sent
- You can message students in bulk from the 'Participants' screen.
- A Message History log is saved of **all messages** you send through Moodle.
- Messages are automatically sent to student whenever you post grades.

Incoming message


WIKIS

WHAT IS A WIKI?

- A Wiki is a web page or a collection of web pages that allows persons with access to modify or edit the content within these pages.
- It is a collaborative web space for creating new content on the web or editing content that has already been posted to that space.

USING WIKIS IN TEACHING AND LEARNING

- Teachers can use Wikis for:
  - Common planning with other teachers
  - Developing open source texts and other resources
  - Resource collection and sharing resources with other teachers
  - As a place to post information/syllabus etc., for students

USING WIKIS IN TEACHING AND LEARNING

Students can use Wikis for:

- Group projects/assignments
- Creating glossaries
- Brainstorming
- Meeting online
- Building a group portfolio
- Writing a collective letter or other document

BLOGS

WHAT IS A BLOG?

A Blog is an online journal (weblog), a webpage that allows users to post content and get feedback via comments. This Internet-based communication tool allows users to collaborate on tasks, issues, or projects. Users can discuss topics with others or simply share points of view.

BENEFITS OF USING BLOGS

- Independent learning of time and space
- Participation-centered
- Improves writing competencies
- Captures changes in thinking
- Promotes Collaboration
- Makes education less rigid and more informal
- Encourages active engagement.

WHY BLOG?

- Gets students relating to each other about the selected topic
- Allows the teacher to relate to individual students
- Commends students or groups of students for encouragement
- Provides support for students doing homework
- Promotes good team spirit and collaboration
- Provides individualized instruction on the topic

POPULAR BLOGGING PLATFORMS

Wordpress

Blogger

livejournal

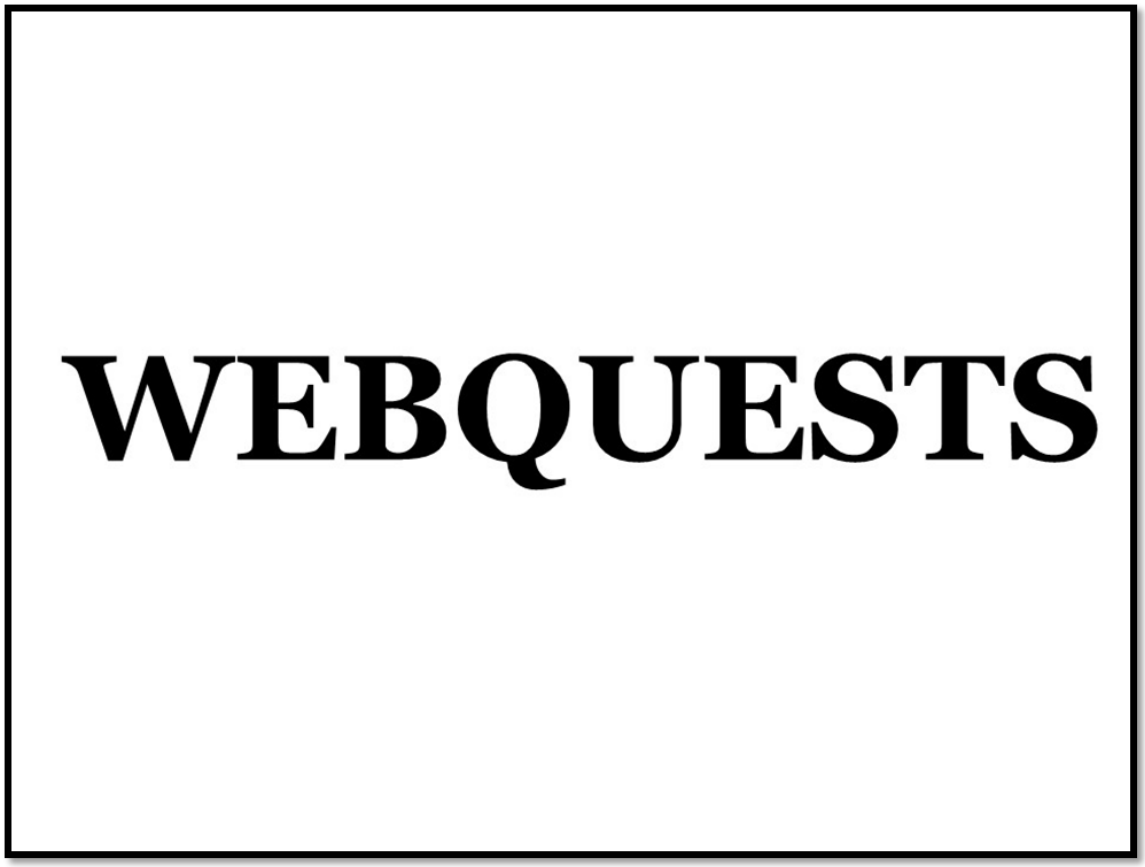
The free communication platform for education.

edmodo alpha

Edmodo is a Blogging platform created for teachers and students.

POPULAR BLOGGING PLATFORMS

- www.wordpress.com
- www.blogger.com
- www.livejournal.com
- www.edmodo.com


WEBQUESTS

WHAT IS A WEBQUEST?

- An inquiry-oriented activity in which some or all of the information with which students interact comes from resources on the web.

COMPONENTS OF AUTHENTIC INSTRUCTION

1. Construction of Knowledge
   - Organizing, synthesizing, interpreting, explaining, and evaluating information to convert it into knowledge
2. Disciplined Inquiry
   - Collecting information via methods of inquiry
   - In-depth understanding via exploration of issues and relationships
   - Elaborated communication
3. Value Beyond School
   - Problem connected to world; links learning to real-world issues faced outside of the school building
4. Implicit View of Students
   - Student as an individual

TWO TYPES OF WEBQUESTS

- Short-Term
  - Designed to be completed in one to three class periods
  - Instructional goal is **knowledge, acquisition, and integration**
  - Deals with acquiring a significant amount of knowledge and making sense of it

TWO TYPES OF WEBQUESTS

- Long-Term
  - Designed to take between one week and one month
  - Instructional goal is **extending and refining knowledge**
  - Deals with deeply analyzing a body of knowledge, transforming it, and demonstrating understanding by presenting it in some way

COMPONENTS OF A WEBQUEST

- Introduction
- Task
- Process
- Information sources
- Evaluation
- Conclusion

INTRODUCTION

- Should orient learners to what is coming
- Should raise interest in the upcoming activity

TASK

- Should describe what the learners will have done by the end of the WebQuest

DESCRIPTION OF THE PROCESS

- Should clearly describe the steps
- Should let the learner know the process to follow to successfully accomplish the task
- May provide advice for handling certain tasks

SET OF INFORMATION SOURCES

- Should be a list of web pages the instructor has selected to help the students accomplish the tasks
- Should include non-web resources
- All resources may not be required

EVALUATION

- Should be clear criteria for how the project will be evaluated
- Evaluation rubrics designed by the teacher are the most effective
- RubiStar is a good source for rubrics
  - http://rubistar.4teachers.org/index.php

CONCLUSION

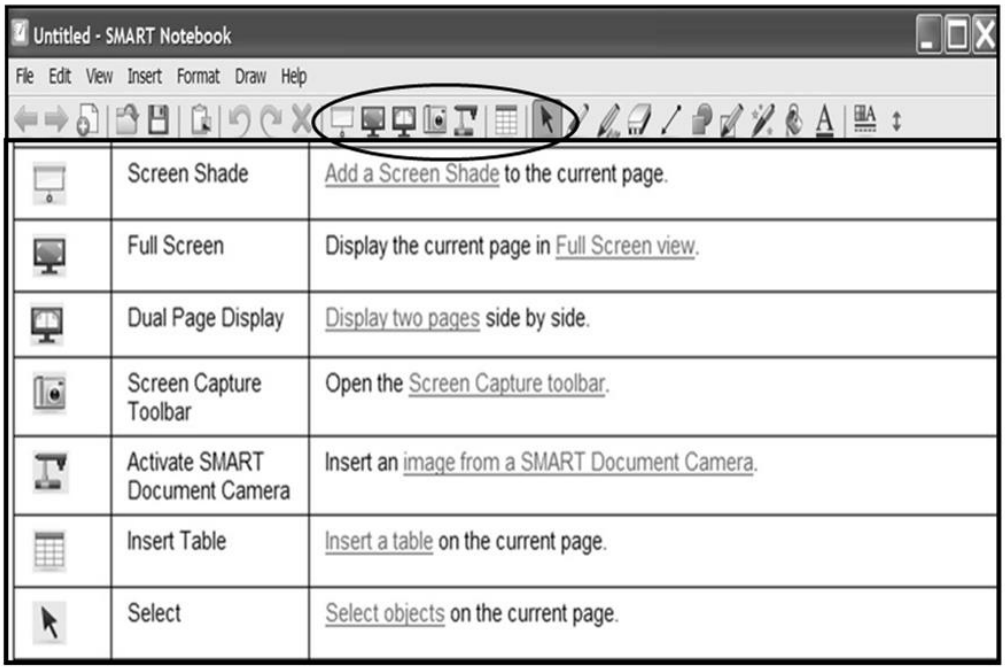
- Should bring closure to the WebQuest
- Should remind learners of what they have learned
- Should encourage them to extend the experience

THE SMART BOARD

ABOUT THE SMART BOARD

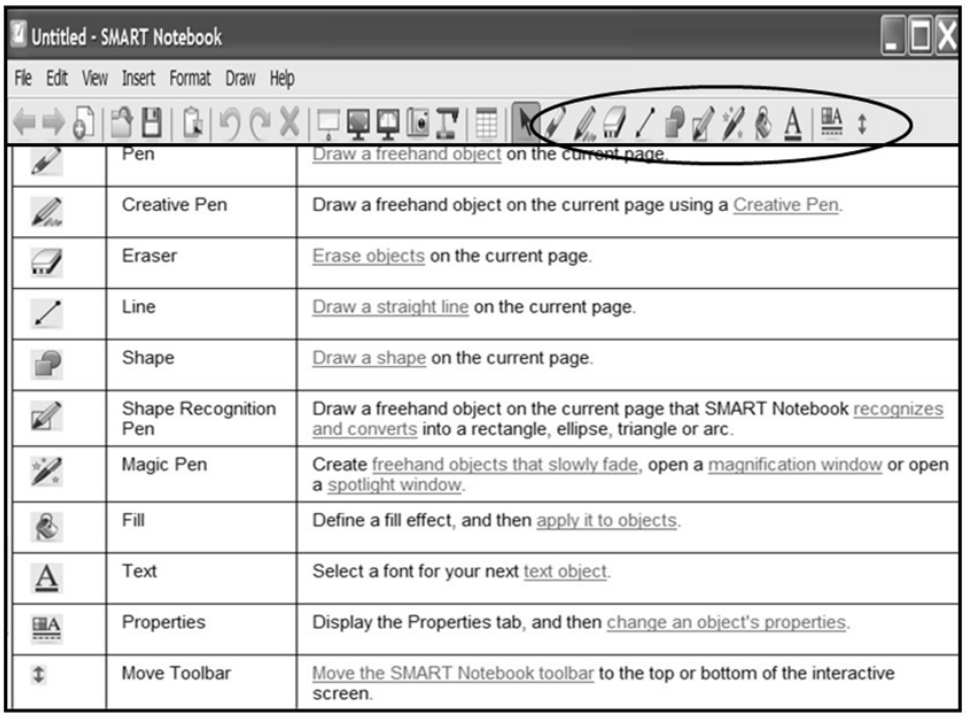
- What is a SMART Board?
  - A SMART Board is an interactive, electronic whiteboard that can enhance instruction and learning.
- The first SMART Board was introduced in 1991.
- It was created by SMART Technologies.
- SMART Board is the first interactive white board.
- Over 800,000 SMART Board interactive whiteboards have been installed and are used mainly in education; however, they have also been used in military, government, and corporate settings.

LEARNING THE BUTTONS & ICONS



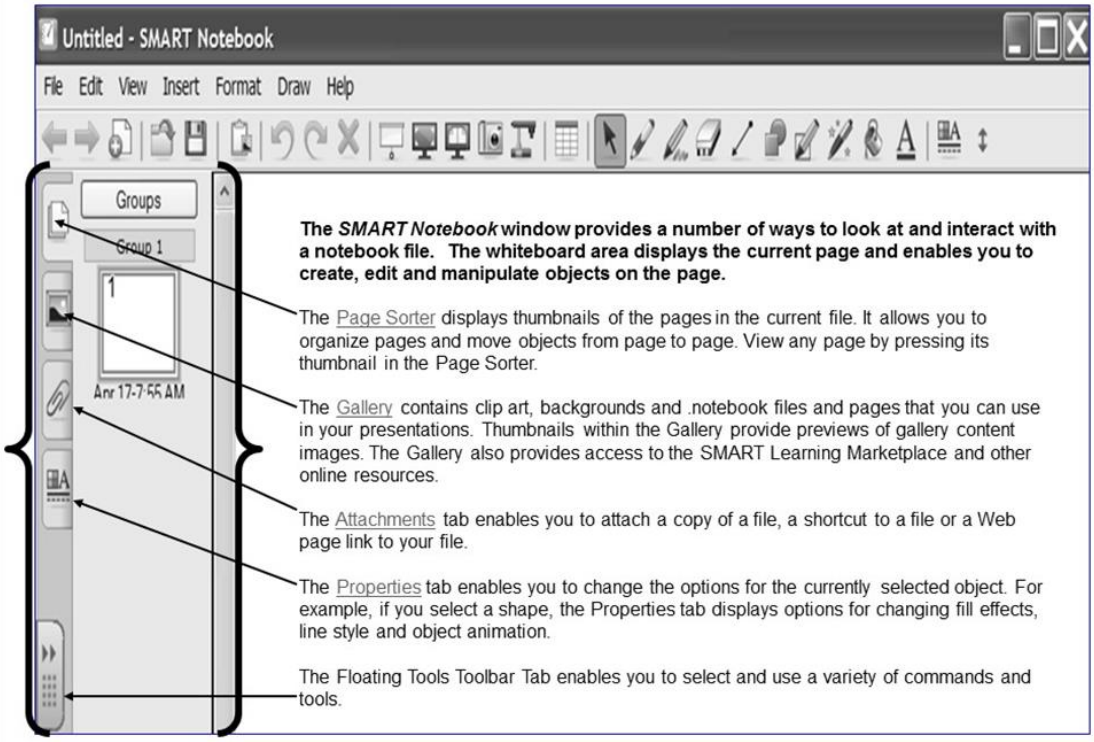
	Screen Shade	Add a Screen Shade to the current page.
	Full Screen	Display the current page in Full Screen view.
	Dual Page Display	Display two pages side by side.
	Screen Capture Toolbar	Open the Screen Capture toolbar.
	Activate SMART Document Camera	Insert an image from a SMART Document Camera.
	Insert Table	Insert a table on the current page.
	Select	Select objects on the current page.

LEARNING THE BUTTONS & ICONS



	Pen	Draw a freehand object on the current page.
	Creative Pen	Draw a freehand object on the current page using a Creative Pen.
	Eraser	Erase objects on the current page.
	Line	Draw a straight line on the current page.
	Shape	Draw a shape on the current page.
	Shape Recognition Pen	Draw a freehand object on the current page that SMART Notebook recognizes and converts into a rectangle, ellipse, triangle or arc.
	Magic Pen	Create freehand objects that slowly fade, open a magnification window or open a spotlight window.
	Fill	Define a fill effect, and then apply it to objects.
	Text	Select a font for your next text object.
	Properties	Display the Properties tab, and then change an object's properties.
	Move Toolbar	Move the SMART Notebook toolbar to the top or bottom of the interactive screen.

THE SMART NOTEBOOK WINDOW



The *SMART Notebook* window provides a number of ways to look at and interact with a notebook file. The whiteboard area displays the current page and enables you to create, edit and manipulate objects on the page.

The Page Sorter displays thumbnails of the pages in the current file. It allows you to organize pages and move objects from page to page. View any page by pressing its thumbnail in the Page Sorter.

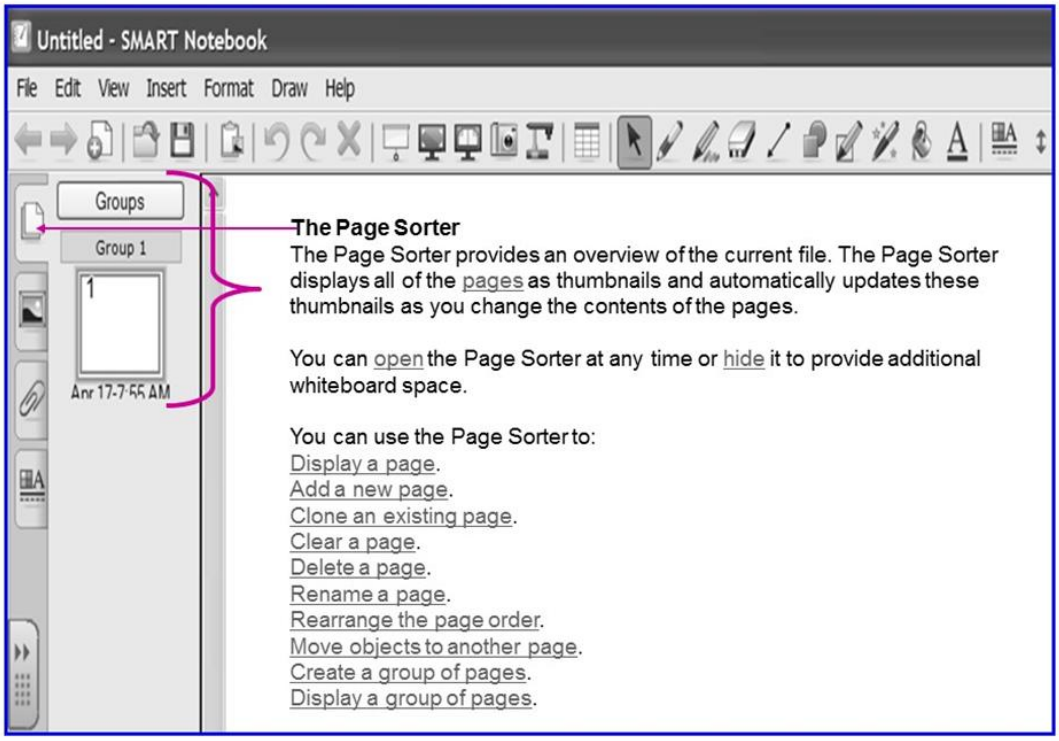
The Gallery contains clip art, backgrounds and .notebook files and pages that you can use in your presentations. Thumbnails within the Gallery provide previews of gallery content images. The Gallery also provides access to the SMART Learning Marketplace and other online resources.

The Attachments tab enables you to attach a copy of a file, a shortcut to a file or a Web page link to your file.

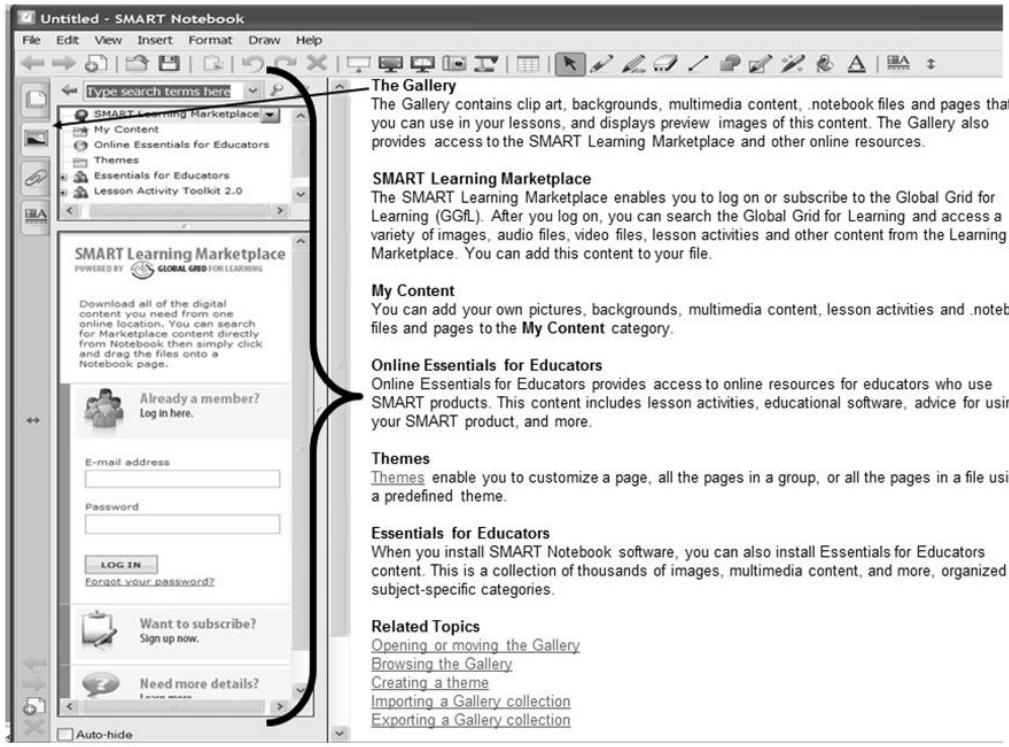
The Properties tab enables you to change the options for the currently selected object. For example, if you select a shape, the Properties tab displays options for changing fill effects, line style and object animation.

The Floating Tools Toolbar Tab enables you to select and use a variety of commands and tools.

THE SMART NOTEBOOK WINDOW



THE SMART NOTEBOOK WINDOW



The Gallery
The Gallery contains clip art, backgrounds, multimedia content, .notebook files and pages that you can use in your lessons, and displays preview images of this content. The Gallery also provides access to the SMART Learning Marketplace and other online resources.

SMART Learning Marketplace
The SMART Learning Marketplace enables you to log on or subscribe to the Global Grid for Learning (GGfL). After you log on, you can search the Global Grid for Learning and access a variety of images, audio files, video files, lesson activities and other content from the Learning Marketplace. You can add this content to your file.

My Content
You can add your own pictures, backgrounds, multimedia content, lesson activities and .notebook files and pages to the **My Content** category.

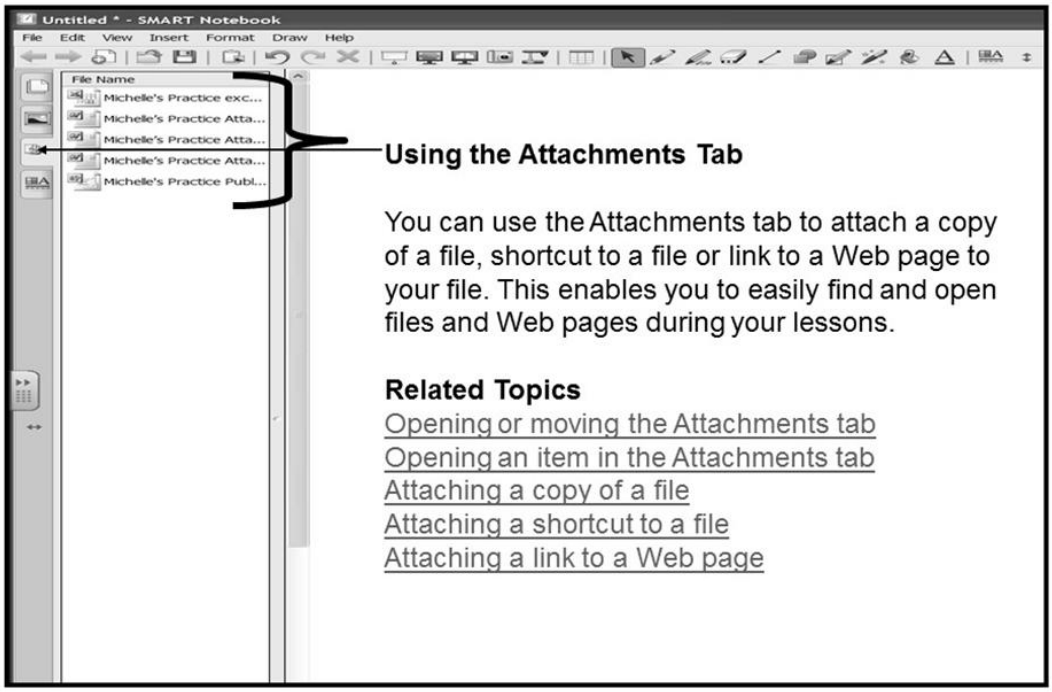
Online Essentials for Educators
Online Essentials for Educators provides access to online resources for educators who use SMART products. This content includes lesson activities, educational software, advice for using your SMART product, and more.

Themes
Themes enable you to customize a page, all the pages in a group, or all the pages in a file using a predefined theme.

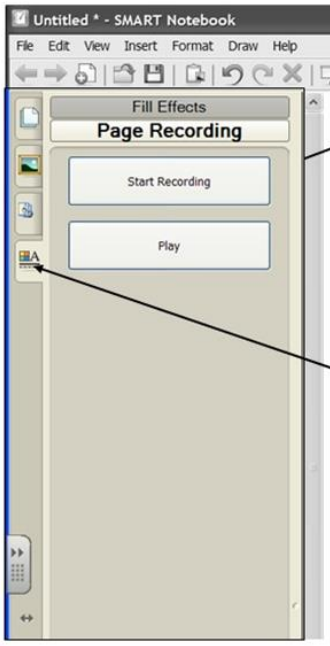
Essentials for Educators
When you install SMART Notebook software, you can also install Essentials for Educators content. This is a collection of thousands of images, multimedia content, and more, organized into subject-specific categories.

Related Topics
Opening or moving the Gallery
Browsing the Gallery
Creating a theme
Importing a Gallery collection
Exporting a Gallery collection

THE SMART NOTEBOOK WINDOW



THE SMART NOTEBOOK WINDOW



Using the Properties Tab

The Properties tab enables you to format objects on a page, including freehand objects, shapes, lines, text, tables and more. Depending upon the object you select, you can change:

- The color, thickness and style of lines.
- The transparency and fill effects of objects.
- The font type, size and style of text.
- The animation of objects.

The Properties tab displays only the options that are available for the object you select.

The Properties tab also includes a **Page Recording** button. You can use this feature to record your actions on the current page.

Related Topics

Opening and moving the Properties tab
Changing an object's properties
Editing text
Changing a table's properties
Recording a page

Floating Tools

The Floating Tools toolbar is a customizable collection of buttons that floats on top of other programs. The Floating Tools toolbar enables you to quickly access frequently-used tools and features.

The default Floating Tools toolbar enables you to write or draw, highlight, erase, draw lines, create shapes,
right-click, start the SMART Keyboard, create .notebook files and undo a previous action.

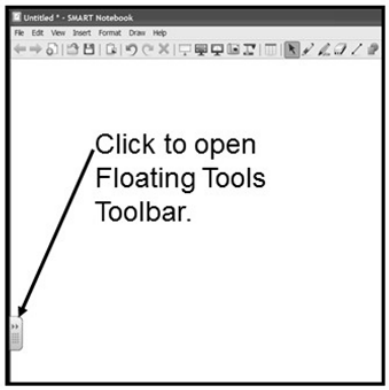
To open the Floating Tools toolbar

Press the **SMART Board** icon in the notification area, and then select **Show Floating Tools**.

NOTE: If your computer is not currently connected to a SMART interactive product, the **SMART Board** icon includes an X in its bottom right corner .

OR

Open the Welcome Center, press the **Tools** tab, and then press **Floating Tools**.



HOW DO I WRITE ON THE SMARTBOARD?

- Your finger is the mouse

- Your finger can also be your pen or you can use one of the 4 colored pens

- Pen Basics… The board only recognizes the last pen or item used
  - So you must set the item back in its right position in the tray before you can use something else
- When you pick up a pen a floating tool toolbar will appear (*if it is not already activated*)
- Now let's practice writing on the smartboard/whiteboard

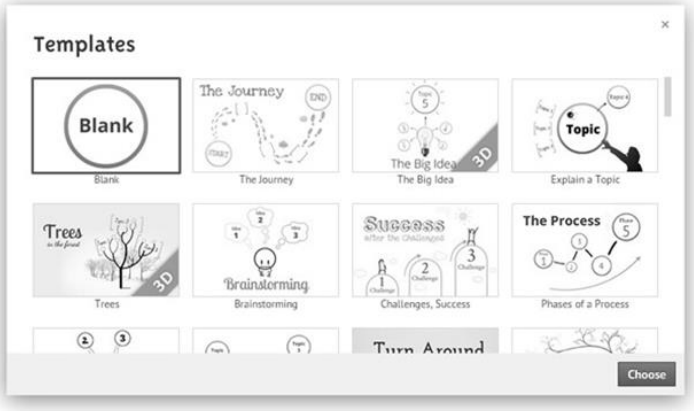
SAVING

1. Pick a pen
2. The floating tools toolbar will appear (*if it is not already activated*)
3. To save anything press the AREA CAPTURE button on the floating tools toolbar
4. Press the interactive whiteboard/smartboard (do not release the pressure) and drag the selection box using your finger to outline the area you want to capture
5. Notebook software will open automatically, and your capture will be saved to a new Notebook page.
6. Select the unsaved Notebook file from the taskbar to view your capture image in Notebook software.
7. Select File then Save to save your notes.


PREZI

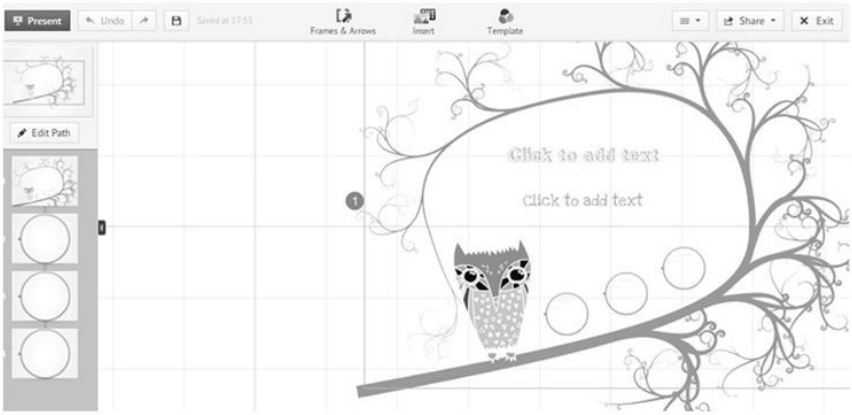
PREZI FOR EDUCATION

- **Step 1:** Sign up at Prezi.com for free and click on "Create New Prezi".
- **Step 2:** Think of a metaphor for your message and find a suitable image on the Net. This image will become your background canvas (you can also use one of the templates available for free from the site).



PREZI FOR EDUCATION

- **Step 3:** Once you have chosen a template, you will gain access to the presentation generating interface. You can click anywhere on the canvas and start typing, but it is easier if you create text fields first. They will allow you to zoom in and out with more ease.



PREZI FOR EDUCATION

- Step 4: Personalize your text by choosing the font, size, and color. You can then move, scale, and rotate your text in order to reinforce your message. Add pictures, diagrams, videos, music, and sound effects.

- Step 5: Edit the zooming path with the left-hand side menu, which also allows you to rehearse your presentation before saving it and exporting it.


TECHNOLOGY
INTEGRATION

WHAT IS TECHNOLOGY INTEGRATION?

When effectively integrated into the curriculum, technology tools can extend learning in powerful ways:

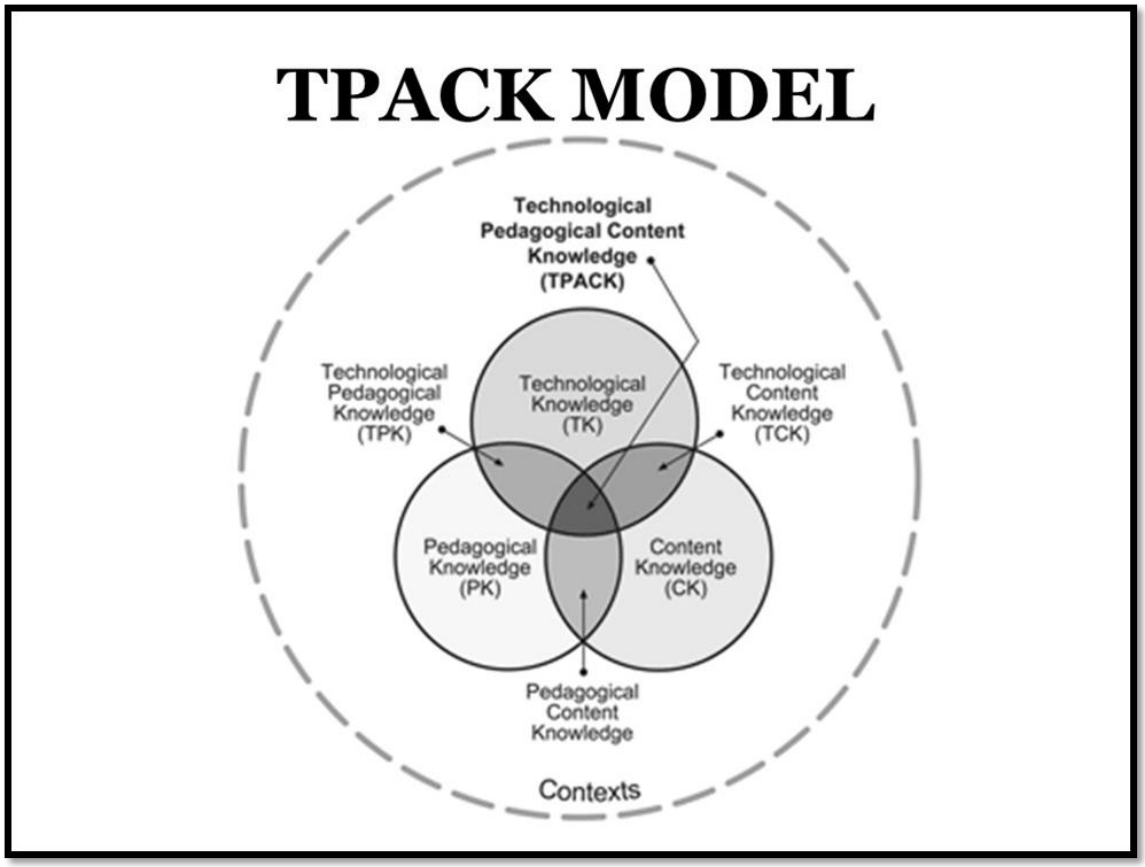
- Access to up-to-date, primary source material
- Ways to collaborate with students, teachers, and experts around the world
- Opportunities for expressing understanding via multimedia
- Learning that is relevant and assessment that is authentic
- Training for publishing and presenting their new knowledge

TYPES OF TECHNOLOGY INTEGRATION

- Instructional tools like Interactive Whiteboards
- Student-Centered Media like Videos, Slideshows, etc.
- Collaborative Online Tools like Wikis, WebQuests, etc.
- Using Social Media to Engage Students
- Game-Based Learning and Assessment

FRAMEWORKS FOR TECHNOLOGY INTEGRATION

- Instructional Tools like Interactive Whiteboards
- Student-Centered Media like Videos, Slideshows, etc.
- Collaborative Online Tools like Wikis, WebQuests, etc.
- Using Social Media to Engage Students
- Game-Based Learning and Assessment

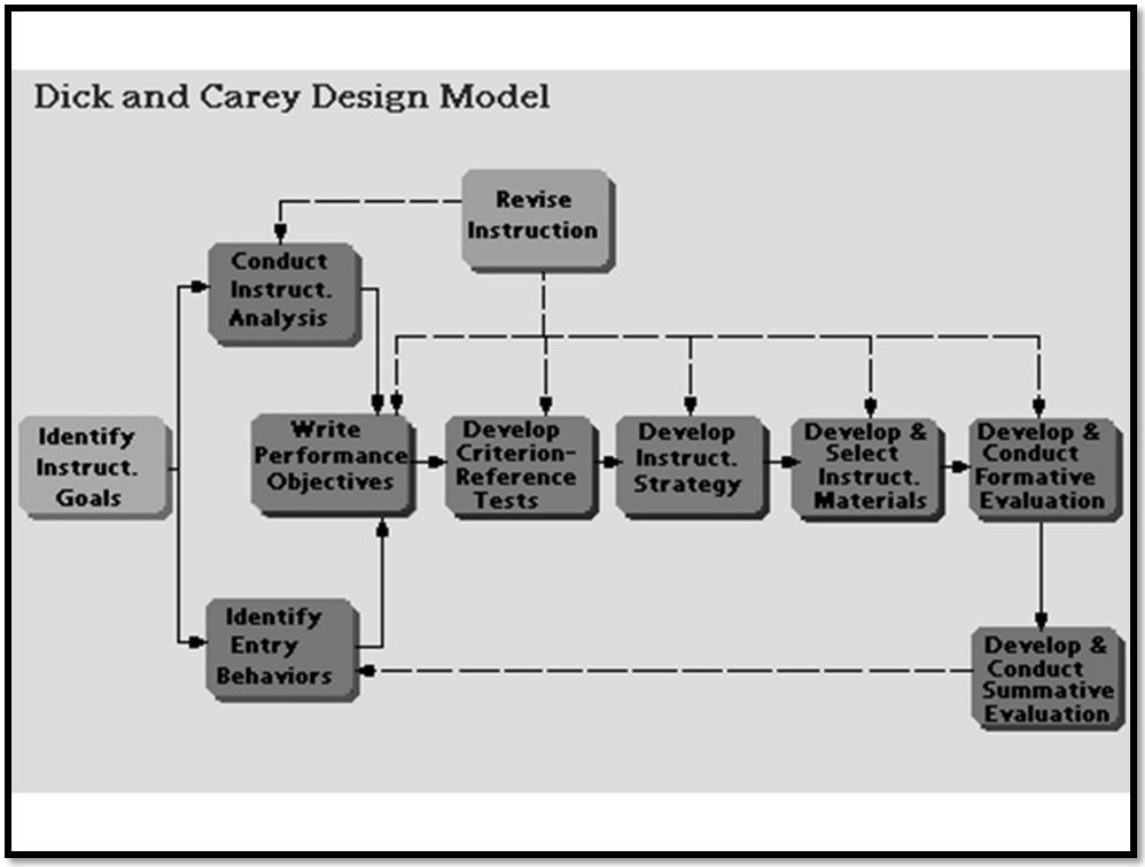

TPACK MODEL
Technological Pedagogical Content Knowledge (TPACK)
Technological Pedagogical Knowledge (TPK)
Technological Knowledge (TK)
Technological Content Knowledge (TCK)
Pedagogical Knowledge (PK)
Content Knowledge (CK)
Pedagogical Content Knowledge
Contexts

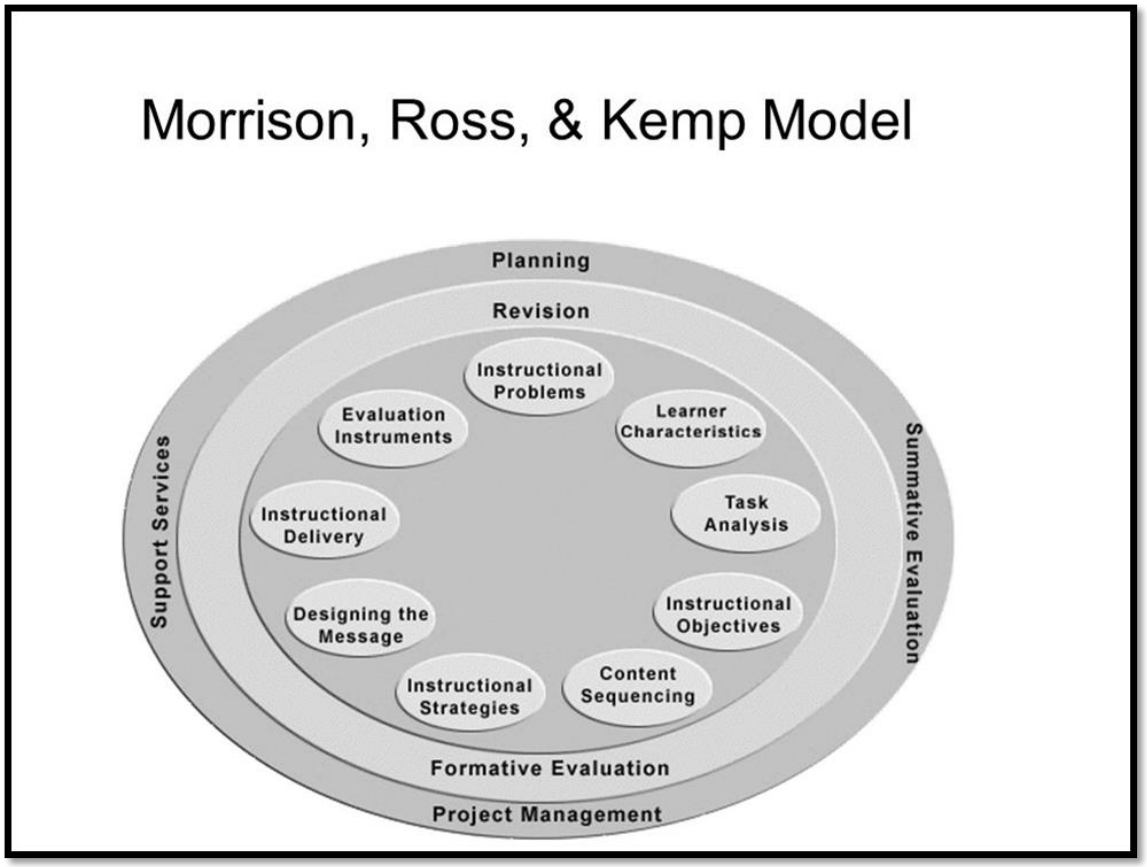
INSTRUCTIONAL DESIGN DEFINITION

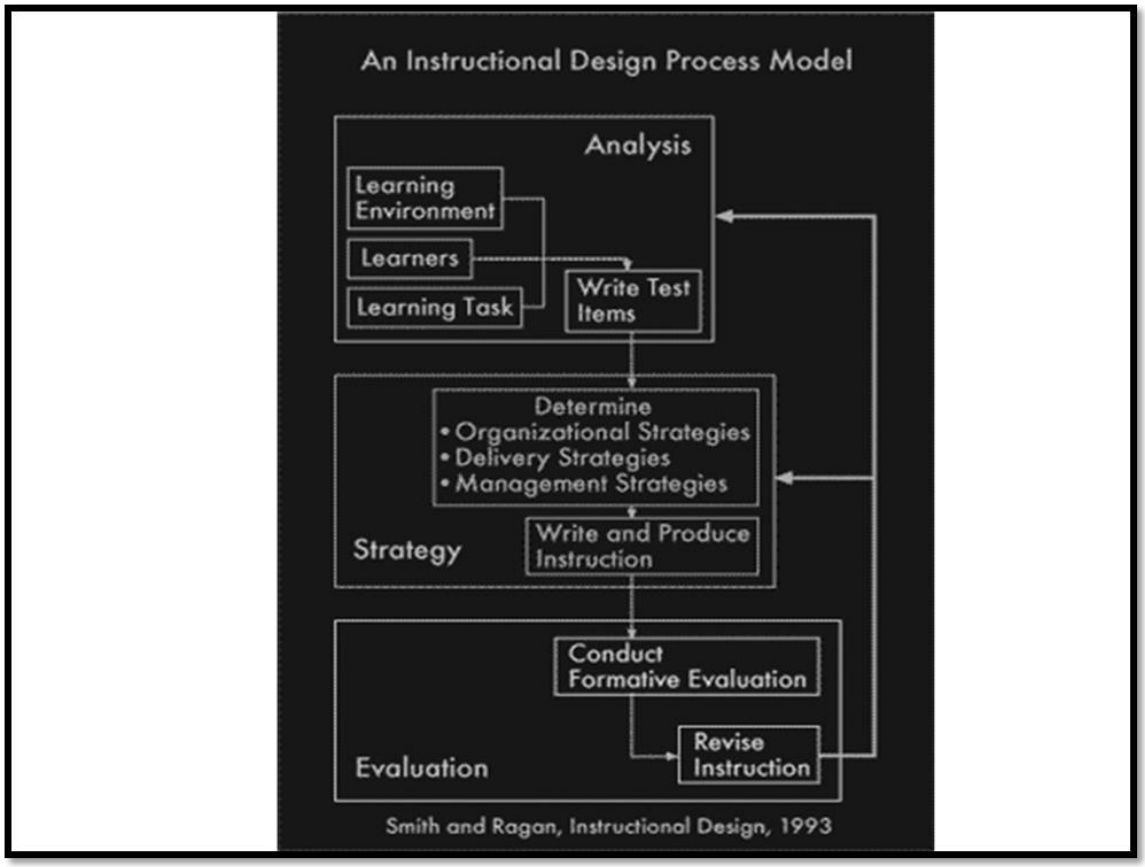
- Instructional design refers to the systematic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources, and evaluation (Smith & Ragan, 1999).

CONSTRUCTIVISM

- Learning is always a unique product "constructed" as each individual learner combines new information with existing knowledge and experiences. Individuals have learned when they have constructed new interpretations of the social, cultural, physical, and intellectual environments in which they live. (Dick & Carey, 2001)
- ID examples: problem-solving, project-based learning


Dick and Carey Design Model
Revise Instruction
Conduct Instruct. Analysis
Identify Instruct. Goals
Write Performance Objectives
Develop Criterion-Reference Tests
Develop Instruct. Strategy
Develop & Select Instruct. Materials
Develop & Conduct Formative Evaluation
Identify Entry Behaviors
Develop & Conduct Summative Evaluation


Morrison, Ross, & Kemp Model
Planning
Revision
Instructional Problems
Learner Characteristics
Task Analysis
Instructional Objectives
Content Sequencing
Instructional Strategies
Designing the Message
Instructional Delivery
Evaluation Instruments
Support Services
Summative Evaluation
Formative Evaluation
Project Management


An Instructional Design Process Model
Analysis
Learning Environment
Learners
Learning Task
Write Test Items
Determine
• Organizational Strategies
• Delivery Strategies
• Management Strategies
Write and Produce Instruction
Strategy
Conduct Formative Evaluation
Revise Instruction
Evaluation
Smith and Ragan, Instructional Design, 1993

EXAMPLE OF ID MODEL: ADDIE

- Analysis
- Design
- Development
- Implementation
- Evaluation

THE ANALYSIS PHASE

- Who is the audience?
- What do they need to learn?
- What is the budget?
- What are the delivery options?
- What constraints exist?
- When is the project due?
- What will the students do to determine competency (Powers, 1997)?

THE DESIGN PHASE

- Select the most appropriate web-based environment by examining the kinds of cognitive skills required to achieve your goal.
- Write the instructional objectives; select an overall approach and the program's look and feel; outline units, lessons, and modules.
- Design course content specifically for use with an interactive electronic medium.

THE DESIGN PHASE II

- What are your objectives?
- What skills, knowledge, and attitudes are you trying to develop?
- What resources and strategies will you use in your instruction?
- How will you structure the content of your learning materials?
- How will you assess the learners' understanding and whether or not they have met the objectives of the instruction?

THE DEVELOPMENT PHASE

- Obtain and/or create the required media.
- Use the Internet's strength to present information in many different multimedia formats so that the learners' preferences can be met.
- Determine the appropriate interactions. They should be creative, innovative, and encourage learners to explore further.
- Plan activities that allow for student group work to help construct a supportive social environment.

THE IMPLEMENTATION PHASE

- Duplicate and distribute materials.
- Install and maintain the course.
- Be prepared in the event that technical problems occur and discuss alternative plans with the students ahead of time.

THE EVALUATION PHASE

- Test for instructional standards.
- Plan several points during the course when students can provide anonymous feedback so that the instructor is aware of student confusion and misunderstanding.
- Conduct formative evaluations to improve the course and summative evaluations to judge the effect of the course.

EVALUATION PLAN

THE EVALUATION PLAN

- At the end of Day 5. a survey will be administered during the final session of the workshop.
- The participants will respond to specific questions on the survey to determine the effectiveness of the workshop.

AREAS COVERED ON SURVEY

- Importance of instructional design models
- The use of Blogs in teaching
- Choosing different web-based resources
- Comparing and contrasting Prezi with PowerPoint
- Expectations of the training
- The effectiveness of training

SURVEY

Use the following scale to answer the questions:

1 - Strongly Agree 2- Agree 3 – Disagree 4 – Strongly Disagree

1.	The principles of instructional design should always be used when designing technology integrated lessons.	1	2	3	4
2.	I feel confident designing and using Blogs in my lessons.	1	2	3	4
3.	I am aware of the different web-based resources and am fully prepared to use them when designing my lessons	1	2	3	4
4.	Prezi provides a wider range of options for technology integration than PowerPoint.	1	2	3	4

SURVEY CONT'D

5. The training met ALL my expectations.	1	2	3	4
6. The training has fully prepared me to successfully integrate technology into my lessons	1	2	3	4

REFERENCES

- www.real.uncp.edu/alantest/Intro_to_moodle.pp
- www.ijiet.org/papers/350-T309.pdf
- https://spacewithapurpose.wikispaces.com/.../Smartboard+Training
- http://cet.usc.edu/resources/teaching_learning/.../Course_Design


"That's all Folks!"

Appendix B: Interview Protocol

Time of Interview:

Date:

Place:

Interviewer:

Interviewee:

Position of Interviewee:

The purpose of this study is to gain an understanding of how you integrate technology into your teaching activities. Therefore, I would like to interview you and observe two of your classes. The interview will last from 45 minutes to an hour. The data collected during this session will not be shared with any other person and your identity will not be disclosed. I will be conducting a similar exercise with other instructors from the Social Sciences department. However, before we begin the interview, I would like for you to sign a consent form.

Questions:

1. a. Please describe your history of using technology.

   b. Has the use of technology changed your approach to teaching? How?

2. a. Please describe your feelings about the impact of technology on teaching.

   b. What is the relevance of this impact on your curricula?

3. a. Please describe the implementation of technology in your classroom.

b. How would you say that the students have benefited from your implementation of technology?

4. a. What, if any, are the critical roles that technology integration plays in your teaching?

b. What is the significance of these roles?

c. How have these roles changed over time?

5. a. Explain how technology integration has influenced your philosophy of teaching?

b. Has this philosophy influenced your colleagues? If so, in what ways?

6. a. What, if any, are the challenges you encounter when integrating technology in the classroom? What, if any, are the supports?

b. How have you dealt with these challenges?

c. How do you value technical support?

7. a. What teaching strategies do you find most effective when integrating technology into your teaching? What teaching strategies do you find least effective?

b. What recommendations would you make to the teachers in training about the use of technology?

8. a. Please describe the common technological tools you use when integrating technology into your curricula?

b. Which of these tools would you consider your favorite and why?

c. With which of these tools are you not comfortable and why?

9. Do you have anything to add?

Thank you for your cooperation and participation in this interview. The information you provided will be kept confidential and will not be shared with another party unless you grant such permission. At a later point, I will be asking you to check the accuracy of the findings from this interview.

Appendix C: Observation Protocol

Time of Observation:

Date:

Place:

Setting:

Observer:

Instructor:

Role of Observer:

Description of the Frequency at which Instructor used Different Technology Applications

Time	Technology Applications	Count
	Presentation Software	
	Word Processing Applications	
	Wikis	
	Gmail	
	WebQuest	
	Google Maps	
	Facebook	
	Skype	

Quotes from Instructors:

Appendix D: Sample Transcript

Corrected Transcription of Interview with Participant #0012 (Dr. Sharon Hayden)

Interviewer: The interview will focus on the integration of technology in the classroom. So I have a couple of questions I have to ask. Alright the first one has to do with your history of using technology. Could you tell me something about your whole history of using technology?

Participant 0012: Well , I've always fancied using technology and actually made efforts to incorporate it into my lessons even before I was formerly trained into how to utilize technology from the low end to the more high end modern technology, so in my last course of study we were given several courses on that and currently I'm involved in terms of Mico itself having ongoing assistance from the technology persons in the e-learning lab and so on which actually helps me to top up what I know but it is something that I considered very important specially with the variety that is out there and most of our students are digital natives so it is important to have technology so I was saying I consider it an integral part in terms of technology incorporating it into our lesson especially since we are teaching teachers. We are preparing them for the classroom and most of them are digital natives so were using technology just to you know, almost natural for them now to understand its importance and role in using it as an educational tool and a vehicle through which we can teach rather than just for fun.

Interviewer: Alright good. How does the use of technology change your approach to teaching?

Participant 0012: For one it makes me more conscious of some of the things you say and do especially body language. I encourage my students in some lessons to actually video tape, both myself and their modeling of lessons and so I think it is very important. It changes it makes you more aware and alert because you know the whole content and you can retrace and especially since it's recorded you know you want to make sure you're modeling and always aware of what is happening in terms of currency of information

Interviewer: Good, I wanna look now about your, talk about your feeling about the impact of technology and teaching, how would you describe your feeling toward the impact that technology has made in teaching generally?

Participant 0012: I think it is a positive impact but it is somewhat underutilized in terms of the force that it can have in terms of its impact, for example if I am teaching something and as I said before especially methodology classes I like to model the teaching if I have the technology to capture I wouldn't have to constantly be going over things I could reply and could use it as a proof of analysis as well so we look back and critique rather than to having to recall did you remember when I said x , you know sometimes having the technology can help to preserve and to balance the

teaching method so I've seen that it is one of those tools that we should not underestimate, and there are so many of them.

Interviewer: Good, how is this impact relevant to your content area though?

Participant 0012: Uum , well In so many of the content areas as it relates to history , I find it very useful for example we…affordability is a challenge in terms of being able to go out on field trips so I limit my field trips to places where we can afford to take the college bus, but my field trips because of technology, are not limited only to a physical visit. I am able to explore online museums and so on so I find it very useful not in the traditional sense of using it to project in order to research and to explore and the students are very excited. I also make them do activities that involve… where they actually use their own technology to create videos, documentaries to create lessons and come back and share with us and I like that, it is fun, and it's something that they do every day so they are now using it for a purpose that is to enhance their learning.

Interviewer: Alright, I want to turn our attention now to the implementation of technology in your own classroom. Umm how would you describe your own approaches to the implementation of technology in the classroom?

Participant 0012: Meaning what the frequency or the point you using?

Interviewer: Right, do you use it?

Participant 0012: I , I must say that sometimes because of availability of resources I just use it as much as I would have, if I have the proper equipment for myself but what I do is to use what we have available so for example I might not be able to have a projector in terms of a multimedia projector but I'm able to put the students based on the resources that they have in terms of whether it's a tablet or whatever smart device so would send them material before and whether it's a video or it's a movie or it is just a PowerPoint presentation so there would be groups collaboratively around that resource I also have resource corners and so we utilize whatever is available at the time doesn't have to be just from a marker center so it can be an individual work station uuh, that's one way uuh. As I said we do a lot of recording of our sessions and replaying for analysis in terms of if a student is being sometimes distracted I get them to do some research once the Wi-Fi is up and they have service. So this is something that becomes almost natural to them. They like to do it with their thumbs and twiddle on their devices, but now they are doing it to contribute to the lesson. So it is from the very basic like that to the very advanced in terms of making it a graded piece of work or a teaching tool.

Interviewer: I am going to ask you to expand on that. How have the students benefited from this implementation?

Participant 0012: They actually are not only enjoy it, but it shows in their academic performance and so they really shine at the end-of-year or end-of-term exams because they are enjoying themselves, I think they are enjoying learning because it has profiled in their skills and talents and they like to

dress up and record themselves and see themselves being played back to the class. So it creates a sort of, an upbeat and competitive atmosphere and each week they try to outdo each other in terms of presentation, even if it is not a graded piece, you find that everybody wants to have themselves recorded and to see themselves and videotape themselves with whatever technology is available.

Interviewer: Alright, want to focus now on a little more in-depth on your integration of technology. Could you identify any critical roles that you think technology integration plays in your teaching?

Participant 0012: First thing as I said, a tool of analysis of self-reflection, in terms of seeing, because we have these multi-modes of information where not everybody wants to see a flat pencil and paper text book. So if they have it in multi-modes the technology helps to do that sort of conveying of the information in a variety in terms of text with images and graphics, and I feel that, that goes a long way, and it gets the students' interests and it adds a lot of variety as we... It can't be overdone because I chose to do it in different ways, the technology is used in different ways as an act of service.

Interviewer: How significant would you say that these roles are?

Participant 0012: Very significant.

Interviewer: In looking further at the roles, do you think they have changed over time?

Participant 0012: Yes. Yes. You go back to my student days, in the 90s when we were taught from the original form of a projector where it was a still image, or superimposing one map over the other in Geography. Now you have so much interaction that can take place, you have a video that is interactive, gaming can come in, the students can do quizzes and so on, I think the roles have changed where it can be more of a facilitating role for the teacher and having the technology. As I said the information is researched, it can be produced in multiple ways, represented in multiple ways, could facilitate the played upon learning styles that are in your class, the most teaching learning styles. I think it has changed a lot, people are no longer just afraid of technology to take over, they are using it smartly to enhance the teaching.

Interviewer: Want to look now at your philosophy of teaching. Could you say how technology integration has influenced your philosophy of teaching?

Participant 0012: My philosophy starts by influencing my embracing of technology. I embrace a constructivist student-centered approach to learning and I believe the students utilize what they like to do, utilizing according to what is happening in the current trends in terms of whatever is available through technology then it actually becomes more of the studentrendcism that I am aiming for so they are able to participate. So if the student is for example reluctant to speak out in class then you can allow them to do some of it pre-recorded and take back or some persons you are surprised at

how well they do in being given the opportunity to be director for an historical thing they have created rather than just writing an essay.

Interviewer: Would you say that your philosophy has influenced any of your colleagues in any way? Do you think so?

Participant 0012: Yes. Because what I do, I do some amount of peer coaching as well peer teaching. So I attend some of my colleagues' classes as well as allow them to come to my classes as well. Sometimes they would ask, "How you do that Hayden?," or I might ask them how they do somethings, but it actually…students generate a little buzz around some of my lessons and so the word spreads and people want to know why. So they would come to class to see or they will ask and I will show and I will share some of the materials that we create.

Interviewer: Earlier you mentioned some of the challenges you encountered in technology integration. I want you to expand on that and tell me more about the challenges you face in technology integration.

Participant 0012: One of the challenges I face is access to the actual technology, or the resources themselves and sometimes we might have a problem in terms of internet or Wi-Fi service. That is basically it. As well as it is amazing but some students are not effective, especially some of my more mature students. They are not very effective for the technology so they, you have to be careful that you don't overuse any one approach or any one form of technology then they begin to say, oh Miss that is a glorified way of chalk and talk and some of them are not amused. When you give them reflections to do they tell you about the enjoyment, and that in the minority but they are still important so I bear that in mind. I do interim analysis of my classes so rather than waiting until the end of the term I find out what is going wrong here, what you think you can do differently. We usually find at least one person saying they want to just sit and listen to me rather than be interacting with the technology. So we can't leave anybody out so we can't leave anybody out. My major challenge is access and numbers. I would wish if my class was like when I was teaching in in the US was in a computer lab with 30' Apple screens, though we don't always get what we want, but sometimes that access and numbers are challenging.

Interviewer: Tell me about Technical Support though. How would you evaluate the technical support you have had access to?

Participant 0012: I would say on a scale of 1-10, 9. I find that if that if you ask for help sometimes immediately you are able to get it, but more so I try to reserve the assistance I am going to need. So beforehand I alert them, if I want access to say the computer lab, I am accommodated. So it is the timing of the request and sometimes and sometimes they have portable resources that can help. I find that our team helps us as much as possible once they are available and they are given advance notice. Or even if it is a simple thing, like I am in the lab and something isn't functioning there is

always somebody and I want to you to think you are stupid, they will help you resolve it.

Interviewer: Now, I want to look at your experience in using technology in more details. What teaching strategies do you find most effective when integrating technology?

Participant 0012: Well it depends on the subject I am teaching. But I find that having the students not just as an audience and not as active learners so that is one of them. Having them gaming also is important for me. The whole grouping and collaborative learning. I place them from the beginning depending on the lesson or in the subject area, I place them in learning communities and I find that assigning them different tasks from the onset and so everything is brought back together, for example, in History classes they might create a documentary and it would have been historical in nature but they incorporate the modern technology in and so on. So the strategies that I utilize are varied, but there is always a role for some form of integration of technology. And I also use it as a tool of reflection. As I said before look back at our lessons and we laugh and we try and see how we can do better the next time. So if you don't sometimes, if you are not aware of what is happening until you see it onto the screen.

Interviewer: Is there any teaching strategy you think would be least effective in terms of integrating technology?

Participant 0012: Lecturing, because that is too dependent on the lecturer. Too dependent on the lecturer and you know even though if you are very dynamic then you can lecture using perhaps a PowerPoint or scripted notes or you can sift through a website and bring up stuff. But lecturing is the least facilitative.

Interviewer: What recommendations would you make to teachers in training about the use of technology?

Participant 0012: Not to be monotonous. Not to be monotonous. Even though it is exciting it can become overdone. So not using the technology the same way so you don't become the PowerPoint either. You know, you don't underutilize it either, some people might book the projector and they just use it for the introductory part, they just play a video and that's it. Because you can use it intermittently throughout the lesson. You can play the video, then you come back and have a quiz, whether it's going to be Jeopardy style or another interactive style, it can be used continuously for giving feedback as well. So just be dynamic.

Interviewer: I want you to give me an idea of the most common technology tools that you actually use.

Participant 0012: So we use the multimedia projector along with the laptop, they go together. Sometimes if I am in the lab then I utilize the Smart board as well as the regular desktop computers so students can access some of the files themselves. The tablet computers, even their cellular phones, I utilize those. Even video cameras as well, we do a lot of recordings.

Interviewer: Any particular applications that you use in teaching, like web-based tools, or anything that you use.

Participant 0012: No, but I am actually in the process of learning how to use the MOODLE platform, we are converting some courses to online. So that is something that is exciting for me. But we utilize the social media strategies as well, WhatsApp, Skype, and so on for interacting. Students might want to put up something, get clarification. IMO, WhatsApp, Skype, regular SMS messaging and so on.

Interviewer: Would you consider any of the tools you use your favorite, and why?

Participant 0012: YouTube and Google Scholar. Once I have the supporting evidence to say unno, what it is saying is actually good quality and it is very viable I find that the students warm-up to YouTube and you have many lecturers and unno persons expounding on issues and topics or it's just to stimulate debate, a lot of that. As well as for me the History channel and some of the US museums and the Budget Museums, I have access to.

Interviewer: Any would you say are not your favorite?

Participant 0012: No, because I go to the ones that I am comfortable with and that I find resourceful and sometimes they lead you to others. So I have not encountered any that is not meaningful.

Interviewer: Coming down to the last question. Anything you want to add?

Participant 0012: I think as a part of professional development, emphasizing, not only emphasizing the importance of technology, because that is usually just talk. But actually having ongoing training for the facilitators would be something that I would welcome. Because technology is so constantly changing that you have to keep abreast to what is happening, so having workshops, having working with our colleagues, and having the persons with the expertise sharing, I think create a good balance and improve the overall instruction and modelling for our students as well.

Interviewer: Anything else?

Participant 0012: Well if we take off, I guess that is it. Well if the persons are more exposed and getting training then that fear or even the negative attitude toward technology might be eroded.

Interviewer: Well I want to thank you very much for participating in the interview. What I will do, I will do some member checking later on…when I collect the data I will allow you to verify the information. Thank you very much.