Web-Based File-Sharing in a Bachelor of Education Program: Transformational Learning

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Abstract:

The purpose of this article is to describe student experiences when incorporating a web-based file-sharing application into a Bachelor of Education (BEd) course. Participants for this participatory action research were 8 first-year BEd students. Participants provided written answers to 16 open-ended questions and partook in 2 focus group interviews. Findings revealed that by using this cloud storage and file-sharing tool (i.e., Google Drive), participants experienced a transformation in attitude and skill with regard to this technological platform. Analyzed through the concept of transformational learning theory, the constructivist learning experienced by students enhanced collaboration, communication, and community among peers.

Key Words:

Web-based file-sharing, Google Drive, transformational learning, higher education.

Introduction

These days, university students have an abundance of technological choices with regard to how they access course content and complete university assignments. For example, students can use cell phones, iPod Touches, iPads, tablets, laptops, netbooks, and a host of other digital gadgets. When students review course content and work on assignments in isolation, such technology is empowering for them; however, when students are required to work in tandem with peers and instructors, this diverse selection of technology can generate communication problems. One way to mitigate such communicative challenges is through cloud computing where instructors and students can co-create, manipulate, store, and share documents that are ubiquitously

accessible—anytime, anywhere, with any tool connected to the Internet. In turn, web-based file-sharing tools have become an integral part of the modern, mobile lives of many students. These collaborative web-based technologies have triggered a wave of free online wikis, word documents, spreadsheets, presentations, and discussion forum software (Fullan, 2013; Preston et al., in press; Rienzo & Han, 2009). Consequently, using these applications as a communicative tool and collaborative learning platform is gaining popularity among university instructors.

Currently, the Net Generation[1] is enrolling in Kindergarten to postsecondary classrooms. This group of individuals has never known a world without computers or the Internet. In turn, there is an urgent need to conduct research pertaining to student manipulation of and learning with technology. In particular, only a small collection of accessible, published research has explored web-based file-sharing technologies (e.g., Google Drive, Dropbox, etc.) and the impression these tools have on teaching and learning within university environments. In light of this research void, the purpose of our research is to describe undergraduate student perceptions and experiences when completing a web-based group assignment in a Bachelor of Education (BEd) undergraduate course. Supporting this purpose, we address two main research questions: (a) What successes and challenges did participants experience while using Google Drive during a course assignment? (b) How did the experience of using Google Drive influence participants' perceptions of digital learning? Understanding the beliefs, perceptions, and experiences of pre-service teachers with regard to the use of this web-based sharing tool has potential to inform pedagogy in BEd methods courses and assist in reducing possible barriers to meaningful implementation of technology within Kindergarten to postsecondary educational settings.

Literature Background

Platforms such as Dropbox, ownCloud, Drupal, OneDrive, and Google Drive are cloud-based software and storage systems that offer an online learning environment for synchronous and asynchronous interaction between students and teachers. Although research on web-based, file-sharing platforms and their roles in university settings is sparse, the published, accessible research we found predominantly referred to the benefits and challenges of Google Drive. With regard to advantages, Denton (2012) found that students enjoyed how, through Google Drive, they could share and simultaneously edit documents, while keeping a digital record of each member's contributions. Wood (2011) found that Google Drive was an ideal way for a group of undergraduate physics students to complete lab reports, where each student in the lab group was responsible for writing parts of the introduction, procedure, analysis, results, theory, and conclusion. Likewise, Sinex and Chambers (2013) and Spaeth and Black (2012) described how college-level science students successfully used Google Drive on group laboratory assignments, where each of the students input data to the shared spreadsheet. With regard to BEd student experiences with Google Drive, Donna and

[1] We define the Net Generation as a group of people born during the mid-1990s and early part of the 2000s. This group of individuals is currently around 1 to 20 years old, grew up with the genesis and/or proliferation of the Internet, and represents the majority of students currently enrolled in Kindergarten to postsecondary education. The term Net Generation was coined by Tapscott (1997).

Miller (2013) found that teacher candidates had reservations about the time needed to learn cloud computing technologies and that this online medium mitigated aspects of face-to-face collaboration. In this same study, teacher candidates expressed concerns about peers potentially making inappropriate comments within the shared documents.

Because web-based file-sharing platforms facilitate the creation and sharing of knowledge and ideas, some university instructors view web-based file-sharing platforms as a social constructivist (Vygotsky, 1978) approach toward learning. Through such this social constructivist lens, knowledge is socially created through online interaction with others, and this knowledge production happens in the same context or community in which the knowledge is used (Lave & Wenger, 1991). Otherwise said, socially constructed knowledge is information that is co-produced and shared by and between its creators. Rowe, Bozalek, and Frantz (2013) believed that the Google Drive platform, when used via a constructivist approach, has the ability to transform student learning, alter teacher-student power relationships, and facilitate critical dialogue and activities related to knowledge and authority.

Abrams (2005) and Veletsianos (2011) believed that digital technology can be used both as a medium for enhanced communication and as a platform for the social construction of knowledge, and, as a result, technology has great potential to generate transformative learning experiences for students. In line with this point, the findings of this research are analyzed through transformation learning theory (Mezirow, 1991, 1997, 2000; Mezirow & Taylor, 2009). Transformational learning theory is based on the notion that learning is influenced by personally-relevant experiences, which are enhanced by social interactions and self-reflection. As a part of this transformational learning, communication and dialogue are essential, because they are channels through which students can construct their own understanding of course content and how to apply this knowledge to their personal life. By using web-based file-sharing to engage in collective learning, instructors enable students to participant in complex real-world situation where "*coming to know* is as important as the *knowing*" (Cormier & Siemens, 2010, p. 38).

Many scholars highlight the disconcerting aspects of private cloud storage systems within the realm of education and public sectors. Predominantly, these issues focus on dependency, security, and privacy (Archer et al., 2010; Mearian, 2012; Owens, 2010; Rosenthal et al., 2010). Sultan (2010) explained that some executives in the Information Technological sector view many web-based platforms as a trap aimed at forcing people to become dependent on proprietary, corporate systems and their services that will likely prove to be a financial burden in the future. Security challenges associated with any off-hosting site of data and services (i.e., cloud-based services) revolve around questions about who can access customer data and what are the security policy perimeters with the host company? (Willcocks, Venters, Whitley, 2014). On a similar topic, the Electronic Privacy Information Center (a not-for-profit organization) filed a complaint with the American Federal Trade Commission about the security and privacy standards of Google's cloud computing, arguing that Google does not encrypt information held on its servers (Marshall, 2009). Sultan summarized these concerns by stating that cloud computing is a rapidly developing paradigm, and many of the issues are likely to disappear as the technology matures.

Research Design: Participatory Action Research

As is common with qualitative research designs (e.g., case studies, phenomenology, etc.), the researcher is often expected to be the authority figure who collects, interprets, and analyzes the findings. Meanwhile, the participants merely represent the voice of people/the case being investigated. In contrast, participatory action research, the chosen qualitative research approach used for this study, validates and honors the experiences of participants, making *them* the co-authority, co-researchers, and collaborators during the planning of the study, gathering of data, analysis of data, and write-up stages of the study. Kemmis and McTaggart (2005) described participatory action research as a social process of collaborative learning done by a group of people in an effort to reflect upon and improve professional or personal practices. The process engages the researchers (who are also the participants) in examining their knowledge, understandings, skills, and values about the topic of interest. It is a self-reflective process where researchers conduct research on themselves, either individually or collectively. Participatory action research encompasses a community of learning (Lave & Wenger, 1991) approach where research is done *with* people, as opposed to research done *on* or *to* people (Savin-Baden & Howell Major, 2013). Further, as explicated by Merriam (2009), participatory action research is a type of research that tends to politically empower the group of people/participants, because the participants, themselves, have authority in the design and implementation of the project. By its very name, participatory action research is *participatory*.

Some scholars may view using participatory action research as the design for this study as highly subjective. Not only do we agree with this statement, we see great value in such subjectivity. In fact, we argue that the findings articulated herein have as much merit (maybe even more) than more traditional ways of conducting qualitative research. For example, all researchers for this study used their personal knowledge, senses, emotions, and intuition to understand the nuances and meaning embedded in the shared data. All data and their representation (e.g., transcripts, analysis, and write-up) have been thoroughly member checked (Chilisa, 2012; Creswell & Plano Clark, 2011; Stake, 2010) by participants/co-researchers. Not only did participants review their transcripts, all participants assisted in the analysis and write-up of the data. By having the authors create and *own* the findings represented herein, a credible, truthful representation of results occurs. As well, for this study, participants use their real names, because they are the authors of their own research. In such a fashion, participants promulgate the results of their own research.

A final strength of this research is that the three core features of the study—the web-based file-sharing focus, the research design, and the theoretical lens—align. That is, the Google Drive assignment with its social constructivist approach to learning aligns with the core concepts of participatory action research, where the social involvement of participants is important. As well, transformational learning theory, with its focus on social interactions and self-reflection, ideally supports aspects of the Google Drive activity and the participatory action research design.

Description of Participant Selection and Web-Based Assignment

As mentioned, participants were eight first-year BEd students. All participants possessed an undergraduate degree, which was a Bachelor of Arts, Bachelor of Recreation and Sport, or a Bachelor of Science degree. After obtaining their first degree, participants enrolled into the University of Prince Edward Island's (Canada) BEd program. As a part of this BEd program, all students, including the eight BEd participants of this study, were mandated to take a class entitled *Communications*. The content within this course included topics such as provincial curricula, lesson plans, unit plans, student assessment, classroom management, and parent involvement in school. The course was offered in two sections, which had enrollments of 25 and 26 students respectively. For this pass-fail course, the instructor asked the students to complete five assignments, one of which incorporated Google Drive. For the Google Drive assignment, each student was asked to choose an instruction method and complete a two-page write-up describing that teaching technique. For each course, every student shared his/her write-up in one Google Drive document. After the assignment was complete, every student in the course had possession of an electronically co-created book describing 25 or 26 instructional methods.

In promoting a type of study where the initial researcher and participants simultaneously became synergetic researchers and participants, the instructor instigated this participatory action research after she completed the course with the students (the participants of this study). Having extinguished the instructor's hierarchical *grading power* over the students, a more equitable relationship among the initial researcher and participants was more likely to occur. Once the course was completed, the instructor invited all students to participate in planning, collecting, and analyzing their experiences with Google Drive, and eight of the 51 students volunteered.

On first consideration, having only about 2% of students volunteer for the study might appear as a drawback. In contrast, for many reasons, we view this number as ideal. First, for most qualitative research, having a limited number of individuals is valuable, because, with fewer participants, more detail can be collected from each individual (Creswell, 2014). This point held true for this study. Second, Chatterton, Fuller, & Routledge (2007) indicated that participatory action research addresses the unique needs of a particular group of people, and, when larger numbers of people are involved in research, greater, more divergent needs surface. In terms of this study, eight individuals allowed for the voice of each person to be heard and attended to during the design and implementation of the study. Third, because the instructor placed great value on the involvement of each participant, she communicated one research invitation to all students. For research projects, multiple invitations or reminders are commonly extended to potential participants. In this case, after eight students almost instantly volunteered for this research, the initial researcher did not seek additional participants. This act reflected her belief that the unique needs of individual participants need to be met when conducting participatory action research. In this case, effectively meeting the research needs of eight participants was ample.

When the researcher and participants initially met, they decided on the type and amount of data to collect. In the end, three rounds of data collection took place over one year. More specifically, about one month after the course, participants answered 16

open-ended questions. Then about two months after the course, one focus group interview (Krueger & Casey, 2009) was conducted. A second focus group interview was conducted about one year after the course was completed. In particular, the timing of this second focus group interview was important, because the data collected during the second focus group interview helped to explore whether the learning that ensued from the web-based file-sharing experience was relevant after a substantial amount of time had passed. Three of the eight participants transcribed the focus group interviews, and every participant was provided with a written copy of focus group interview transcripts. Each participant read the transcripts, concentrated on his/her particular voice, and performed a member check to ensure that the meaning he/she intended to convey during the focus group interview was accurately understood and translated in the written documents (Imman, Howard, & Hill, 2012). In turn, the initial researcher and one participant analyzed the findings and, again, asked for input, changes, and consensus among all participants.

Data Findings

In reviewing the data, most participants experienced transformation stages of learning. During the first part of the course, they felt apprehensive about using Google Drive, but, toward the end of the course, they felt confident and comfortable with this cloud storage platform. A challenge relating to Google Drive was its lack of speed and functionality when too many users were simultaneously working on the document. A second concern was issues related to the student's accessibility to the Internet and a Google account. Enriched descriptions of these thematic findings are provided below.

Transformation in Attitude and Skill

Most participants felt extremely apprehensive when they first heard they needed to complete an assignment using Google Drive. Angie commented, "I had never even heard of Google Drive before; I was not familiar with it at all and felt totally out of my element and comfort zone." Similarly, Rachel said, "When I first heard of this particular assignment, I had never used or viewed Google Drive before." Shannon explained, "Many students were intimidated and concerned about using Google Drive. Most students who I conversed with about Google Drive had not used this tool prior to being enrolled in this course." Julie added that other students in the course "wondered why we were using so much technology in this particular class. Some seemed very hesitant to try Google Drive." Kaitlyn explained that she was pleased to hear that Google Drive would be a part of the course, but, at the same time, she "had some misgiving about the idea, as well."

Brittany and Robyn were two participants who had some *a priori* knowledge with regard to Google Drive, and Joseph had used it quite extensively. As compared to the above participants who had no knowledge of Google Drive, these participants viewed the assignment differently. For example, Brittany said, "I felt excited about the opportunity to use Google Drive in an assignment." Robyn said, "I was pleased to find out I would be getting more experience using it during the duration of the course, as I had had only minimal experience with it up to that point." Joseph indicated, "I was glad for the opportunity" to use it in the Communications course. In light of these data, it

appears that even having limited experience or knowledge of Google Drive made the idea of working with this file-sharing tool less intimidating.

After the participants completed a collaborative assignment with Google Drive, the indifferent-to-anxious attitude that most participant initially felt changed dramatically. Angie explained how and why her attitude changed:

> I found myself being excited and enthralled while working on this assignment. I loved how my work was always automatically saved in Google Drive. I also loved how I could access my work on any computer, since it was web-based and not saved on my computer alone. I also enjoyed being able to see all of my peers work in progress.

Julie who originally stated, “I had never head of Google Drive prior to this class” at the end of the course stated, “I love Google. Google anything. Google Drive, Google search, whatever. I just absolutely love Google.” Shannon initially said, “My initial reaction to Google Drive was one of imitation.” However, after completing the assignment, she said, “Google Drive is an excellent web-based program that I continue to use on a regular basis.”

Moreover, when interviewing these same students a year after the course, all participants were still using Google Drive and its accessories in a variety of creative ways. Rachel said, “I do use it a lot right now. It’s great for collaborative work, group projects, and things like that. I wish I had discovered it earlier.” Rachel also provided detailed of how she continued to make use of Google Drive for her role as President for a student association:

> The other week, we had a meeting, and one of our members was in Nova Scotia. She was our secretary, so she was supposed to be taking notes. What happened was she Skyped in. I created a Google Drive page for here. So, while we were Skyping with her, from a different province, she was typing the notes for the meeting—notes we could see. It’s so neat that we can do that, it’s just really amazing.

A year after completing of the course, Kaitlyn said, “I use it [Google Drive] all the time. I used it today in class, actually.” Similarly, during the second focus group, Angie was still excited about her new technological knowledge. She said, “I didn’t know about Google Drive until I started this program, and it still blows my mind. I now think it’s the coolest thing ever.”

A year after their course experience with Google Drive, Shannon, Robyn, and Julie indicated that they, too, continued to use it. Shannon explained, “I use Google Drive on a regular basis. I use it mostly for Word processing. I use it a lot with group work, because we are able to work on a document together, simultaneously even.” Robyn indicated, “I use it all the time if I am creating a document at home on my laptop, and I don’t want to take my laptop to school with me.” Julie provided details about her most current use of Google Drive when she said:

> I actually used it in my class, right before this meeting. We had a group of five of us. We had to find 10 things and then put it on a slide show. I had the

> presentation and the document open, and we were all working on it, all five of us. I use it on a regular basis.

In summary, with regard to using this web-based file-sharing tool and its applications, most students started from a point of hesitation. Then, once they used the application, feelings of trepidation subsided, and they began to use the application for other personal, professional, and educational reasons.

Benefits of Google Drive in Course Setting and Beyond

Participants spoke about the benefits of using Google Drive in the Communications course. Angie said, "My favorite part was how easy it was to comment on people's work. I also really enjoyed the live chat option that it gave." Brittany talked about the ubiquitous access capability: "What I like most about Google Drive is the convenience it offers. Since Google Drive is a web-based application, I can use *any* computer to access all files I've uploaded—they are stored there indefinitely." Rachel believed that the shared work-in-process document was valuable in helping her finish her assignment. She said, "I could go and look at everyone else's assignment. It was good to get ideas of what to do in terms of formatting, length, writing style, etc." Robyn relayed a similar comment: "It was also useful, because you could reference your work to others in the class to make sure that you were formatting it correctly and including the appropriate information." Shannon's summed up most of the views of her peers when she said:

> I was impressed with so many aspects of this web-based word processor that enables you to save and share your work online. With the service being web-based you no longer have to have a hard drive or flash drive to save your work. With this tool, you are able to access your information anywhere. I was impressed with my ability to work on the assignment simultaneously with my peers. With this tool you are even able to view the changes that you and your peers and making as they happen. It was an excellent tool for peer editing in that we were all able to access the document easily and efficiently to edit each other's work. It was simple to make and delete editing comments. It was an excellent tool that enabled each of us to contribute to the larger master assignment to come together to collaborate and create our document.

At the end of the assignment, Joseph was appreciative of the book that the students co-created via a Google Drive document. On this point, he commented, "I was most pleased to see the collaborative book come together as well as it did, especially since this book has been preserved for future use."

After expressing the course-based educational benefits of the file-sharing assignment, participants began to discuss how Google Drive had great potential to support social constructivists learning among their future students. In particular, many participants believed that the Google Drive application was an effective tool to promote the co-creation of knowledge among student groups. Rachel indicated, "The editing, sharing and chat functions all lend themselves quite nicely to a cooperative setting." Brittany talked about Google Drive's potential for group work and said, "A classroom setting would benefit greatly from the collaborative nature of Google Drive; it would take group projects to a whole new level." Joseph provided additional details on what these

collaborative student efforts might look like. “Corrections and edits can be made from virtually any computer with the technological capability to run the programs; and one may even chat with their partners while writing the paper.” Julie also provided ideas for how teachers could effective use Google Drive to promote student collaboration: “A teacher could group their students into groups of five, set up different Google Drive documents, share it with their group members, and have the students discuss a topic given to them by the teacher through Google Drive.” Robyn stated that Google Drive would be an effective medium for sharing of slides or notes with students who are absent from class. Shannon believed that Google Drive could make teaching and learning easier and more accessible for both educators and students. Rachel’s comments expressed how her teacher identity was being affected by the Google Drive experience.

> Prior to this course, I had not given a large amount of thought to the implementation of technology in a classroom at any level from Kindergarten through Grade 12. Cell phones, blogs, Twitter, and other social media platforms seemed more so a distraction than a tool. . . . Now, I think Google Drive seemed to lend themselves well to educational assignments. I would be curious to see how other popular social websites might be brought into an educational context with the same levels of success.

In summary, perhaps one of the greatest benefits of the Google Drive experience was that after first-hand experience with using this application, participant gained technological confidence. Possessing this technological confidence was a type of seed that participants needed in order to grow from a teacher candidate enrolled a BEd program to a self-regulated classroom teacher poised to incorporate technology in a future Kindergarten to Grade 12 learning environment.

Challenges Related to Google Drive

With regard to completing their web-based assignment, participants also relayed some of the challenges they experienced while working with the platform. Joseph explained, “Google Drive was running rather slow ever since it updated its programs, so I had to write my first draft locally (i.e. without using the Internet), then copy and paste that to the Google Drive document.” Julie thought about students who might not have Internet connection at home, and said, “Technology can be frustrating and dampen learning for those specific students, because they cannot access what other students are accessing.” Robyn was a bit concerned about the fact that all students need to have a Google account before they could gain access to the Google Drive application.

Because the assignment had one collective due date, Kaitlyn explained that many people ended up working on the document at the same time. As a result, “It was running a bit slow. When you typed something, it wouldn’t show up until 3 or 4 words later.” In turn, although Robyn believed that Google Drive was a “very useful tool for collaborative projects, but [it] should only be used for small groups and not the entire class.” In contrast, Rachel noted, “Personally, I did not have as much trouble as everyone else . . . I had my assignment completed before a lot of people started using the program at once.”

Discussion

At the start of the course, most participants were skeptical about the merits of the web-based assignment, but, after working with this digital platform, they gained valuable, first-hand experienced, therein becoming more comfortable with the tool. For those participants who had little to no background about how to use file-sharing for social constructivist learning, working with Google Drive helped them embrace concepts of e-learning and e-pedagogy. Once they began to use Google Drive, their intimidation of the online platform subsided, and they began to believe they could successful maneuver the technology. Evolving from this belief, they began to develop their personal identity as a teacher who could effectively implement this technology in future classrooms, therein supporting the constructive learning of their students. Thus, for participants, their *experience* promoted *belief*, which supported *identity*.

In the context of this research, the steps of *experience*, *belief*, and *identity* illustrate a journey of transformation learning. One of the first steps of transformational learning is when an individual critically evaluates personal thoughts, values, and perspectives in an effort to determine whether those views are functional and true (Mezirow, 1996). With regard to this research, most participants began with doubts, but, through experiencing Google Drive, they were able to self-reflect and changed their initial thoughts about the assignment. As related to the belief-stage in transformational learning, Taylor (2009) described transformational learning as a type of communicative process, which involves the identification of intentions, assumptions, and motivations, and feelings and then critically assessing these issues through peer dialogue, debate, and reflection. Participants were able to critically assess this experience and openly articulate their beliefs about the experience through being involved in the research. In this sense, participatory action research appeared to assist in promoting transformation learning. With regard to forming an identity and transformational learning, Mezirow (1991) believed that transformational learning is a series of exhilarating, but difficult, learning phases, which include disorientation and confusion, self-examination of core beliefs, building self-confidence in new roles, and integrating of a new perspective into one's life. For some writers, the ultimate result of transformational learning is reflected through a state of personal emancipation, often embodied through social action campaigns aimed at addressing social injustices (Brockett & Hiemstra, 1991; King, 2005; Mezirow, 1981). In the case of this research, participants spoke about their intent to use this tool to promote constructive learning for future students. Upon first read, this point might not appear to be a fervent social campaign, but, upon additional consideration, we believe teaching students to work in unity is a prime example of social justice.

As the findings revealed, participants communicated a number of challenges in using Google Drive. For example, they spoke about too many participants using the system simultaneously. They also envisioned how Google Drive may pose some challenges for student who do not have access to the Internet at home or who do not have a Google account. During this phase, they were beginning to see themselves as teachers and the possible learning barriers they might face when using this technology in their class. Furthermore, within this vision, some participants touched upon potential social injustices associated with Google Drive.

As alluded to above, the process of participatory action research may have actually supported the students' transformational learning journey. Both during their written responses and focus groups, time was set aside for participant to partake in metacognitive activities, where participants could *think about* how they *thought about* technology before and after experiencing Google Drive. The other important step of the transformative learning experience was having the participants involved in rich, communicative environments, where this group of individuals could reveal and safely discuss their conflicting feelings, thoughts, and past actions (Carter, 2002; Taylor 2009). Again, the modes of data collection (e.g., written responses and focus groups) within this participatory action research design were the channels for such discussion. Participants' transformation learning was also exemplified in their comments during the focus group a year after their initial Google Drive experience. All participants not only continued to use Google Drive, but many participants built upon their knowledge of Google Drive by using it in unique creative ways such as via co-created group PowerPoints and shared minutes of organizational meetings. In turn, longitudinal data collection via participatory action research may support transformational learning.

Contribution to Teacher Knowledge and Practice

This research supports the idea that teacher candidates in a BEd program need to be provided with learning opportunities where they can gain knowledge, confidence, and skills with technology, because doing so helped develop their identity as a teacher who is equipped with e-pedagogical experience. Such firsthand experience, and moreover, the possession of this identity will assist them as they incorporate technology into future Kindergarten to Grade 12 classrooms. In turn, an implication of this finding is that if higher education is to successfully prepare teacher candidates for leading their own classroom, hands-on technological learning must be incorporated into the delivery of content and other aspects of BEd courses. To accomplish such, university instructors need to have some level of technological experience and expertise themselves. That is, in order to be facilitators and/or role model for teacher candidates, university instructors need to be comfortable and somewhat up-to-date on issues regarding e-pedagogy. Admittedly, university instructors do not need to be experts in the field of Information Technology (IT); however, they do need to be equipped, at a minimum, to act as facilitators for the students in the area of technology. In supporting instructors in their role of technological facilitators, university leaders must provide IT support staff to instructors who need this service.

Both students and instructors are constantly faced with a barrage of new and innovative technological gadgets, social media tools, and educational applications. For this study, it may have appeared that Google Drive was incorporated into the Communication course merely to ensure that this cloud computing platform could be experienced by the students. It is important to clarify that the learning outcome for the web-based assignment was to have teacher candidates learn about effective instructional methods and co-produce and share their learning. It is the responsibility of the instructors to promote what is pedagogically relevant, not the specific tool or company promoting the tool. As applied to this study, the learning outcome of the course assignment was not to experience the Google Drive application itself. When instructors are considering the incorporation of technology into their teaching and

student-related activities, the chosen technological feature should be used as the framework to promote dialogue, communication, and learning. Otherwise stated, effective pedagogy and student outcomes should drive the choice of technology, not vice-versa.

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