

A qualitative investigation of doctoral students experience with mobile devices

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Abstract

Mobile technologies have evolved into the means of gaining access to information for learning. Its application in higher education is still a novel concept, particularly in underdeveloped countries. This study is aimed at exploring the views of doctoral students regarding their learning experiences with mobile technologies. Student focus group interviews of 24 doctoral students from 3 different academic institutions were interviewed. The participants' responses were recorded, transcribed, and analyzed to make conclusions. According to the findings of this study, mobile devices play an important part in the learning experiences of doctoral students. The participating students engaged in collaborative learning using mobile technologies. Given the benefits of adopting mobile technologies for learning activities, academic institutions should focus on teaching faculty members to use this to involve students in their learning process. The implications of this study call for the continued advancement of mobile technologies to facilitate effective learning experience for the multitude of mobile learners in developing countries. Another implication is that academic institutions with collaboration with libraries should see the need to develop user friendly mobile app that is linked to the library management system. Such an application would allow the students to optimally use their smartphones and tablets to search the library's resources from their mobile devices. Training should be offered to the teaching faculty members to come to terms with the benefits of mobile technologies for learning activities.

Keywords: Mobile technologies, learning experience, doctoral students, information sharing, ease.

Introduction

Today's information users appear to be technologically savvy (Shonhe & Jain, 2017). There is a plethora of smartphone and tablet applications available that can help students with their information demands and facilitate research (Fritschi & Wolf, 2012). As these technologies advance, students will require support in learning how to properly search for information. Students can search for information in university programs that use mobile technologies. Because of advancements in mobile technologies, most students not only own many mobile devices (Vázquez-Cano, 2014), but now most students use these technologies in their academic lives as well (Barfi, Arkorful & Abaidoo, 2021; Chen & deNoyelles, 2013).

When it comes to learning opportunities, Kim and Frick (2011) believe that the usage of mobile devices can help students learn more effectively. According to Al-Fahad (2009), research on students' adoption of mobile learning shows that they are becoming active learners who have a lot of influence over their learning activities. It's fascinating to see how mobile technologies are influencing students' learning styles. Mobile technologies appear to play an important part in doctoral students' learning experiences. Doctoral students can benefit from collaboration enabled by mobile technologies. Schuler, Hutchins, and Lashell (2012) define collaboration as the state in which students use mobile devices to share academic-related information with colleagues. Users can exchange learning resources and even revise their colleagues' assignments with the use of mobile technologies (Kiryakova, 2017).

Mobile technologies continue to provide diverse learning options for students. Mobile technologies not only reduce the time of getting information but also provides a platform for information sharing and collaborative learning which add new dimensions to students learning experience (Miller & Doering, 2014). The use of mobile devices currently plays amazing roles in terms of teaching and learning. For instance, students can use learning management systems to easily access information online to satisfy their information needs, access academic databases, and a website, to name a few. They can also access their lecture materials on their mobile device. This was made clear in the works of Masiu and Chukwuere (2018), who claimed that students' life has been made easier by mobile devices because they may access course materials on them. Despite these contributions of mobile technologies to students learning, little is known about how such contributions influence doctoral students learning experiences in Ghana. To increase the rate of information consumption for purpose of academic and policy innovations, doctoral students should be able to learn anywhere and at any time at their own pace (Khaddage & Lattemann, 2013). The question that arises is whether doctoral students are exploiting mobile technologies to achieve their learning experiences or potential in Ghana.

Additionally, the advent of mobile technologies has occasioned the use of social networking sites which promotes information dissemination. Within the educational sector, these social networking sites are being used for collaborative learning or information sharing. Libraries are developing mobile application platforms to help in information retrieval (Burford & Park, 2014; Vandi & Djebbari, 2011). How well are these platforms contributing to the learning experience of doctoral students in Ghana?. As a result, it's critical to examine how mobile technologies are contributing to the learning experiences and how these students (doctoral) are exploiting the mobile technologies to advance collaborative learning and information sharing.

The study aimed to address the following research objectives:

1. To acquire a better understanding of doctoral students' learning experiences with mobile technologies.

2. To examine how mobile technologies ease information sharing among doctoral students.

Literature Review

This section examines some of thematic concepts pertaining to students' experience with mobile devices for learning. This includes mobile technologies, the advantages of mobile technologies, social media technologies and construct created to address the use of mobile devices for learning.

Mobile technologies

Mobile technologies can be thought of as internet enablers that employ mobile devices to store, identify, and transport information for consumers (Vandi & Djebbari, 2011). As a result, Kim, Mims and Holmes (2006) define "mobile technologies" as the various types of mobile devices available. The term 'mobile technology,' according to them, refers to several gadgets (such as smartphones, tablets, PDAs, iPods, and laptops) that allow users to access data and information from any location. Similarly, Elkins, Hwang, Kim, Manolovitz, Mueller and Owens (2020) observed that while looking for information on mobile devices, consumers are not restricted to specific times or locations.

Advantages of mobile technologies

Users benefit from some features of mobile technology. The device's mobility, simplicity, and availability are among the characteristics noted by Khaddage and Lattemann (2013). Short, Linn, Merianos, Burke, and Upperman (2014) avers that these mobile technology properties or characteristics enable quick and dependable access to a variety of information on the Internet. Given these characteristics, mobile technologies have enormous potential to improve learning. According to Barfi, Bervell, and Arkorful (2021), the use of mobile technology in the classroom has made learning more personalized and self-directed. Chang (2013) supports this viewpoint, observing that users used mobile devices to browse, search, and receive library services without regard to location. This occurs when users access learning management platforms for the study material via their mobile devices.

Mobile technologies, according to Yeboah, Nyagorme, and Barfi (2020), offer access to information. These mobile devices can also be used to gather and disseminate information knowledge. Mobile technologies, according to Saxena and Yadav (2013), function as the primary point of contact for users seeking and sharing information with the aid of technology. Meyer (2016) claims that technical devices let users design and customise online information searches, as well as create an interface to fit their information needs.

Mobile technologies have the potential to be a useful tool for promoting collaborative learning (Barfi, 2020). Students can share their knowledge and experiences with their peers through collaborative learning. Students in a collaborative atmosphere, according to Burford and Park (2014), can obtain academic information for optimal learning. This form of learning can help kids develop critical thinking skills and gain confidence in expressing their thoughts and opinions (Phongtraychack & Dolgaya, 2018).

Users can also explore library databases on their mobile devices for information that will help them complete academic assignments like presentations and personal research. It was revealed that students are involved in a wide range of responsibilities. These responsibilities include completing a take assignment, preparing for discussions,

writing an academic paper and preparing for a conference. To perform such activities, students can use mobile devices to access learning management services or institutional repositories for academic-related information.

Social media technologies

Users can share information using social media technologies (Akeriwe, 2013). Social media technologies, according to Sharma and Godiyal (2016), are internet-based platforms that foster user communication, content exchange, and cooperation. This type of service, according to Akeriwe (2013), enables users to browse and search for online information. Examples of social media technologies are Google team, Zoom, WhatsApp, Microsoft teams and Facebook group chat.

Construct created by authors to address the use of mobile devices for learning

In today's world, mobile devices have a big impact on how people share information.

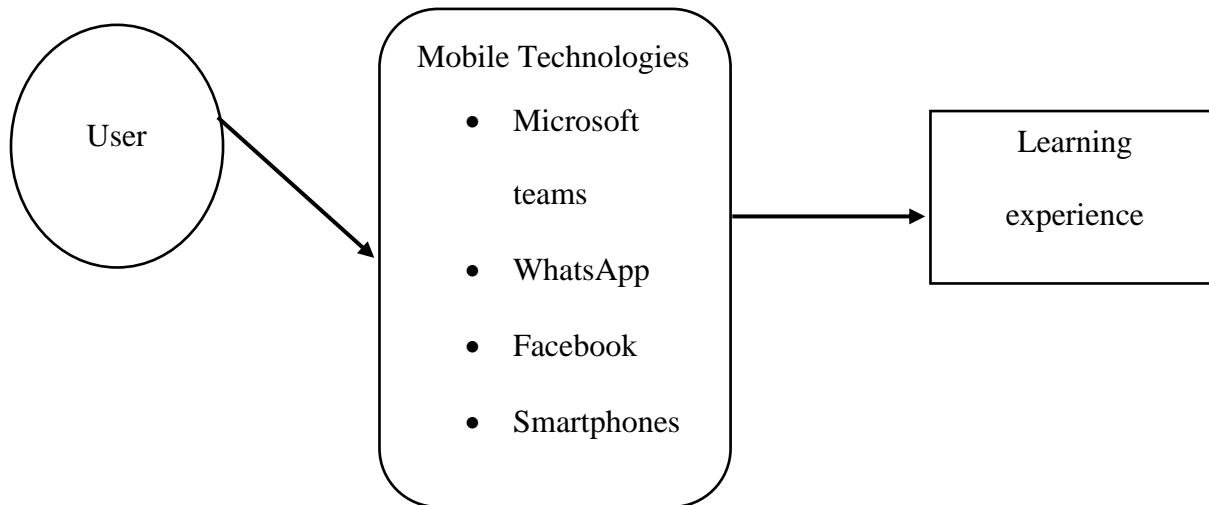


Figure 1: Graphical representation of mobile technologies and students' learning experience

Figure 1 gives a summary representation of doctoral students learning experience within the context of mobile technologies. From the diagram, it could be observed mobile technologies intermediate doctoral students (users) and their learning experiences.

Methodology

This study adopted a basic interpretive qualitative study developed by Merriam (2009) to understand the learning experiences of doctoral students who use mobile technologies in their studies. In this study, participants' information was gathered through interviews. The researchers employed an inductive research style, and the research findings are descriptive. Through analysing the data inductively, repeated patterns were identified. Finally, comprehensive and descriptive research findings were discussed following past issues developed by Merriam. Thus, in-depth face-to-face focus group student interviews were conducted to collect their views on mobile technologies for learning.

Sample

To align the student use of the mobile device for learning, the researchers adopt the Gikas and Grant (2013) requirement of mobile computing device characteristics. In terms of the context of the research, the researchers followed Gikas and Grant's (2013) approach with some customization. The study invited doctoral students from the University of Cape Coast (UCC), the University of Ghana (UG), Legon, and the University of Education, Winneba (UEW). A purposive sampling technique was adopted in selecting these 3 Universities from Ghana. The researchers observed 24 doctoral students utilizing mobile technologies for instructional purposes. The respondents were selected based on their experiences of using mobile technologies for academic-related activities. This technique is similar to that of Grundmeyer (2012). He used participants' experience as a factor in selecting volunteers for his study. The doctoral students were asked to participate in focus group interviews to provide their thoughts on mobile learning.

The focus group interviews were conducted following Krueger and Casey's focus group interview criteria (2009). Participants in the same programme were arranged in groups and the interviews were also audio recorded. Since the sampled participants come from different universities, the 24 participants were grouped into three with 8 from each of the three locations. A week before the interview day, each group's interview schedule was created. Before the interview session, each student was given the interview questions. This made the interview go more smoothly and in less time. All of the interviews were audio-recorded using sound recording devices. The audio recordings are subsequently transcribed into transcripts, which can be read again and coded for analysis.

To make the data more comprehensible, it was summarized and relevant categories were identified and kept in files. The researchers eliminated probable data inaccuracies throughout this stage of the analysis. The derived data were categorized and summarized according to the relevant themes.

Data analysis

The analysis in this study attempts to narrate and interpret the students' views about this phenomenon. The Gikas and Grant (2013) qualitative data analysis approach was used by the researchers, who used inductive data analysis to create themes and categories from the 'bottom-up' to organize the data into a more abstract form of information.

To obtain a complete comprehension of the content, it was read several times. Rereading the manuscript and comparing it to the recorded interviews assisted the researchers in organizing and editing the statements made by the participants. To make it easier to manage, the obtained data were summarized, and relevant categories were recognized and saved in files. The researcher eliminated potential flaws in the data throughout this stage of the analysis. The derived data were classified and summarized based on the pertinent themes. The empirical findings were provided following the study's research objectives.

Trustworthiness

Data triangulation was used to increase the data's credibility, as the interviews were supplemented by documentary data. Furthermore, participants were chosen from several university departments so that perspectives on the same issues could be easily cross-checked, enhancing the accuracy and reliability of the findings.

Findings

The goal of this part is to present empirical evidence on how doctoral students use mobile technologies for learning and how mobile technologies facilitate information sharing. Mobile learning entails the use of learning-enabled mobile devices. Mobile devices used for learning must be able to connect to other devices to give instructional content and allow students and instructors to exchange ideas. This indicates that mobile learning occurs when users have the means and ability to use their mobile devices in conjunction with other interconnected gadgets.

Research Question 1: What are the learning experiences of doctoral students in the use of mobile technologies for learning?

Doctoral students learning experiences may be influenced by mobile technologies. When asked about their experiences searching for information on their smartphones or tablets, most of the participants answered that they have been using them for a long period. As a result, they have the requisite technical knowledge and skills to conduct effective information searches using these devices. Six of the participants, namely Participants #A, #B, #F, #H, #J, and #N, responded to this question by saying: "I have been using smartphones and tablets in information seeking for some time now; even from my undergraduate days and I'm very conversant with using my smartphone in searching for information in all areas."

Participant #O, on the other hand, believes he is an expert at utilizing a smartphone to find academic and non-academic material. When it comes to searching for information, he claims to be an expert at utilizing his smartphone and tablet. Participant #O agreed with Participant #K when he claimed that he knows how to use his mobile device for information searches. In furtherance of the remarks of Participants #K and #O, Participant #E stated that she was familiar with the usage of mobile technologies when looking for information.

Participants #C, #D, #M, #P, #T, and #Y, on the other hand, claimed that they can download any information they require from online journals, e-books, online dissertations and theses, and other e-resources using their smartphone. Similarly, Participant #Q said she uses her mobile device to connect to the Internet and enters or writes "certain terms to obtain varied outcomes." She then checks through the results she's retrieved, downloading what she requires and saving the sources she's chosen for later use. "I plan and structure my searches," participant #S continued. I begin by downloading the articles, then sit down and look through them to preserve the important ones." Mobile technologies were used to complete these downloads. Some of the participants saved the downloaded information on their Google Drives (to which they had access on their mobile devices, such as smartphones and tablets) for future use after downloading the information they needed.

It was discovered that users access learning management platforms for study materials via mobile devices. Mobile devices, according to the participants' comments, made it easier for them to move around while still being able to view study-related content on their devices.

Research question 2: How do mobile technologies ease information sharing among doctoral students?

The major goal is to determine whether mobile technology can be leveraged to facilitate information sharing. It was revealed that the participants used a familiar platform to share information in real-time using their

mobile devices and tablets. When looking for information, the participants' responses suggested that they collaborate with their peers. Participants #K, #M, #P, and #S are the best at explaining this. They claim that if they don't understand anything, they asked their friends for explanations and clarifications, who then explain it to them. In turn, Participant #J disclosed that she prefers reading in her room, but that if she doesn't understand something, she turns to her classmates for help by using a shared social media platform where they discuss subject-related concerns.

Similarly, Participant #G mentioned that when a colleague wants to offer a journal article as a potential source of information, a mobile communication software like WhatsApp makes exchanging information very simple. Using WhatsApp assists her in obtaining additional information to better comprehend the subjects and problems she finds challenging in her education. This is due to the fact that she can discuss academic concerns with her peers. She mentioned that her academic colleagues had varying levels of experience and knowledge of the subject and that they utilize their mobile devices to post comments and discuss various topics on social media. She also emphasized the importance of holding such debates on a unified platform.

Information services that enable the transmission of data from one end device to the other are also deployed via mobile technology. Based on the empirical data, it was discovered that mobile technology lets the students cooperate and share knowledge more easily. The method in which the participating students were able to exchange knowledge and ideas demonstrates the relationship between mobile technologies and collaboration. The flow of information from one information user to another is made easier with the introduction of mobile technologies (mobile applications like WhatsApp).

Discussion

The empirical data gathered from the doctoral students are presented in this section. The findings revealed that the doctoral students who took part in the study had learning experiences with mobile technologies when searching for information. The participants' responses indicated that mobile technologies play a significant role in the learning experiences of doctoral students. Mobile applications have been discovered to make mobile learning easier. Mobile technologies, according to empirical evidence, have mobile applications that aid students in their learning experiences. For this reason, the participants are required to be able to connect to the Internet. Similar findings were discovered by Qayyum and Smith (2015). They discovered that students might use their mobile devices to connect to the Internet and search for information. Students looked to be at ease using these electronic resources for learning, according to them and Elkins et al., (2020). The replies of the participants are comparable to those recorded by Barfi (2020). He stated that the chances that people have when searching the Internet for information on their mobile devices have made mobile technology the ideal information resource for learning. Students thought using mobile devices to seek information was very useful and appropriate, according to these researchers. Furthermore, students' ability to download material for learning has improved as a result of employing mobile devices to seek information (Barfi, Bervell & Arkorful, 2021; Omidian, 2011). As mobile technologies advance and become more accessible to all students, the number of students who use them will rise. Doctoral students will have additional possibilities to learn when they are exposed to and use mobile learning environments.

Mobile technologies are also used to deploy information services that facilitate the transfer of data from one end device to another. According to the empirical data, mobile technology benefited the participating students

in collaborating and sharing knowledge with their peers. The method in which the participating students were able to exchange knowledge and ideas demonstrates the relationship between mobile technologies and collaboration. The flow of information from one information user to another is made easier with the introduction of mobile technologies (mobile applications like WhatsApp).

Some of the participants utilize WhatsApp to collaborate and share information with their peers about their studies. They share information and 'explain' things to one another for this reason. WhatsApp is a brief messaging tool that is used to cooperate as well as to develop knowledge and skills via the usage of mobile devices. WhatsApp provides a collaborative venue or platform. The doctorate students who took part in the study were able to work in groups, and it is during this time that collaboration becomes effective because they were able to tackle information-related challenges that were too difficult for individuals to answer alone. Participating students were able to easily explain specific ideas to their colleagues who had a knowledge gap thanks to the use of WhatsApp. This response is consistent with the findings of other researchers, including Kiryakova (2017) and Schuler, Hutchins, and Lashell (2012). They discovered that mobile devices, in general, increase the opportunities for student collaboration in learning. As a result, they were able to work together to tackle information-related challenges that were too difficult for the participants to handle on their own. Participants might also contribute material relevant to their subject of study and even modify the work of their peers.

Conclusion and Recommendation

According to the findings, mobile devices play a vital role in the learning experiences of doctoral students. Doctoral students can engage in additional learning activities outside of class as a result of these experiences, giving them more learning chances. Mobile learning has been discovered to be facilitated by mobile technologies. The study's findings revealed that doctoral students viewed mobile devices as a useful learning tool for communicating with classmates, exchanging learning materials, and group learning.

Furthermore, the doctoral students used WhatsApp to collaborate. Doctoral students could also use WhatsApp to share material relating to their assignments. The doctoral students who took part also used their mobile devices to save and download information for later use. The participating doctoral students engaged in collaborative learning through the use of mobile technology, allowing for information sharing and knowledge transfer. After lecture times, doctoral students might use mobile technology to communicate, comments and make suggestions to their lecturers for further explanation using mobile technologies.

Given the benefits of adopting mobile technologies for learning activities, academic institutions should focus on teaching faculty members to use this to involve doctoral students in their learning process. Training should be offered to the teaching faculty members to understand the potential benefits and features of mobile technologies that could help engage doctoral students effectively to promote teaching and learning activities. In order to improve doctoral students' mobile learning experiences, the results also highlight the necessity for institutional support to invest in academics' professional growth and technology training.

Implications of the study

This study is very relevant because of the growth of mobile device ownership and usage among not only doctoral postgraduate students but among students in higher education in general. Higher education institutions must dedicate more thought and attention to the development of mobile learning programs now and in the future, given the growing trend of widespread usage of mobile technology. Given the continued advancement of mobile technologies and the growing number of mobile device users, educators and institutional leaders will need to create more mobile learning environments and interventions to facilitate effective learning for the multitude of mobile learners in developing countries.

Another practical implication is that academic institutions with collaboration with libraries should see the need to develop mobile app that is linked to the library management system. In essence, this will bring together stakeholders and librarians to create mobile library applications for developing countries that maximize the value of mobile applications for learning experience. Such an application would allow the students to optimally use their smartphones and tablets to search the library's resources from their mobile devices. This will broaden the range of possibilities available for information searching activities.

Limitations of the study and suggestions for further studies

In the university community, there are many different types of information users. There is also a large number of university employees that work in administrative roles. Due to the nature of the study and the research objectives, the study was confined to selected doctoral students who use mobile devices for information seeking. Future studies could look into administrative staff's mobile learning experiences.

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