

Selected Stakeholders' Views on the Use of Tablets for University Learning: A South African Case Study

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Abstract

The popularity of mobile technologies has greatly influenced people of all ages, especially adolescents. The purpose of this research was to determine the views of students, lecturers, and managers as selected stakeholders to assess the effectiveness of tablet computers in learning at a South African university. Using a mixed-methods approach, this case study focused on Extended Stream students who were enrolled in a degree program in Information and Communication Technology or Electrical Engineering. Survey participants consisted of 155 students and 25 lecturers, and interviews were conducted with 18 students, 5 lecturers, and 9 managers. Data collected from closed-ended questionnaires were entered manually into the Statistical Package for Social Sciences (Version 24) and then analyzed using descriptive and inferential analyses, using an independent samples *t*-test. Data collected from interviews were transcribed and analyzed using thematic analyses to generate major themes and subthemes. Findings from the statistical analyses of quantitative data revealed that there was no significant difference between the views of students and lecturers on the effectiveness of the use of tablet computers for learning. The thematic analyses of qualitative data revealed that students, lecturers, and managers all concurred that tablets have a positive impact on student learning.

Keywords: tablet computers, learning, mobile technology, stakeholders' views, university

Students in the 21st century have transformed drastically in terms of finding new learning methods and exploring technologies (Prensky, 2005). In order to maximise the potential of technology in student learning, effective ways of integrating the latest technology in the classroom must be found (Geist, 2011). Institutions in this era are improving radically by incorporating advanced technologies in the classroom (Kyzym, Petukhova, & Kaidalova, 2017). Brown (2000) states that students are utilizing technologies such as the internet successfully, thereby discovering a new method of obtaining knowledge and learning.

Mobile learning devices such as smartphones and tablets can greatly enhance students' interest in their studies at both the pre-university (Popović, Marković, & Popović, 2016) and the university level (Lin & Lin, 2016). These devices also aid in mobile learning, allowing students to learn at a convenient place and time (Menkhoff & Bengtsson, 2012). It is absolutely necessary to

integrate tablets into learning and teaching for the purpose of switching from the chalk and talk approach to a blended learning approach (de Figueiredo & Afonso, 2005). Meurant (2010) postulates that the tablet is a game-changing device that is probably going to modernize education.

Many institutions all over the globe have already spent a large amount of money on purchasing bulk quantities of tablet computers for the benefit of their students (Vu, McIntyre, & Cepero, 2014). Foresman (2010) and Miller (2012) emphasize that many universities around the world are integrating tablets into the curriculum as a cost-saving, interactive, and collaborative tool.

The effectiveness of technology in institutions can be seen only if it is incorporated with curriculum standards (Debele & Plevyak, 2012). In a study designed to assess the need for technology in the classroom, Sugar (2005) found that technology had a positive impact on teachers. Another study conducted by Roschelle et al. (2010) revealed that technology in the classroom enhanced students' learning capabilities.

A study conducted by Percival and Claydon (2015) in Canada to determine the views and attitudes on tablet use for learning revealed that students had mixed opinions. Generally, students appreciated the portability and easy access of tablets, but some were concerned with the distractions caused by those who use tablets for non-learning purposes. In Mango's (2015) study, students had a very positive perception of tablets as learning tools. Using tablets in the classroom not only boosts students' interest in attending lectures (Rossing, Miller, Cecil, & Stamper, 2012) but also improves their confidence (Shen, 2016).

Although many educational institutions around the globe have already started using tablets in the classroom, there is also a dearth of empirical research on how to implement tablets in the classroom (Pegrum, Howitt, & Striepe, 2013) and how tablet use affects students' learning (Wakefield, Frawley, Tyler, & Dyson, 2018). Even though tablets are the latest tool for learning, there are some serious gaps in this area of research that need to be addressed, such as how well students are using tablets in the classroom and whether tablets can increase students' motivation, engagement, and participation. Such investigations have been done in developed countries such as Canada (Karsenti & Fievez, 2013), Australia, (Clarkson, 2018), and the United States (Chou, Block, & Jesness, 2012, 2014; Mango, 2015; Shen, 2016). However, very little research has been done in developing countries like South Africa. Therefore, research on the views of stakeholders such as students, lecturers, and managers on students' use of tablets for learning in university classrooms is needed.

Literature Review

In a study investigating the perceptions of university students in the United States on the use of iPads in their learning, Mango (2015) found that "students not only enjoyed using the iPads but also saw them as effective learning tools"

(p. 56). A mixed-methods approach study conducted by Rossing, Miller, Cecil, and Stamper (2012) with 209 students from Indiana University – Purdue University Indianapolis revealed that some students felt that tablets were a hindrance to their learning. However, the majority of students felt that tablets were a motivational tool to learn the topics, attend classes, and actively participate. Ađir (2015) conducted a study in Turkey to evaluate how well tablets were used in a classroom and whether they increased students' motivation to learn. Findings showed that students did not use tablets to read e-books or create presentations but did use them to gather information. Overall, students reported positively on synchronizing smart boards and tablets in education. A study conducted by Hahn and Bussell (2012) explored the experiences of undergraduate students at the University of Illinois regarding their use of iPad 2 tablets for their course work. Using focus groups and survey data, they found that students used the device as a learning tool, "particularly for in-class use . . . [and] to connect with course-specific content" (p. 42). In a quantitative study using a 5-point Likert-scale questionnaire, Diemer, Fernandez, and Streepey (2012) explored how tablets had impacted undergraduate students' perceptions of learning and their engagement in active and collaborative learning during tablet-centered activities. Their findings showed that the adoption of tablets had enhanced collaborative learning and engagement between students. In a qualitative pilot study conducted in the Midwestern United States with a total of 237 students, Chou, Block, and Jesness (2014) found that students had more openings to work together in groups for the project and brainstorm with their peers to be more creative. The students were also interested in attending classes to perform tablet activities, which makes them productive. The purpose of Rossing's (2012) study was to determine the perceptions of university teachers on student tablet use when tablets were incorporated into communications courses. He used observations, discussions, and experiences to capture the teachers' perceptions of tablet use. The findings indicated that the use of mobile devices invited collaboration and cooperation as well as changed the way that students interacted with one another and applied their knowledge.

Conversely, the findings from an online survey conducted by Long, Liang, and Yu (2013) in China showed that although students agreed that tablets could be used as a learning tool, students who owned tablets used them for entertainment purposes only. Similarly, the study conducted by McBeth, Turley-Ames, Youngs, Ahola-Young, and Brumfield (2015) also indicated that although tablets enhanced students' critical thinking and collaboration, the use of tablets created some pedagogical challenges. A research study conducted by Ađir (2015) warns that students must pay attention to their work instead of being distracted. However, Ađir (2015) and Mango (2015) found that tablets facilitated students' participation and collaboration when they worked on projects in a group.

The purpose of this study was to gather the views of stakeholders such as students, lecturers, and managers to assess the effectiveness of using tablets in learning at a university in the Eastern Cape Province of South Africa. This study was guided by the following research question: How do students, lecturers, and managers differ in their views on the effectiveness of tablet use for learning in university classrooms?

Research Methodology

The instruments used in the mixed-methods research consisted of closed-ended questionnaires and interviews. A mixed-methods approach was used in this study because the different instruments used to collect the data offered valuable and pertinent information about the phenomenon in this study. The researchers used a case-study research design with elements of descriptive survey research and interviews. Although structured survey questionnaires were given to university students and lecturers, interviews were conducted with all stakeholders: students, lecturers, and managers. Data were collected from all participants at the end of 2017.

Study Site and Context

The selected university is situated in the Eastern Cape province of South Africa. The researchers chose this university for the study because it was the only university in this province where students and lecturers used tablets for learning and teaching. At the university, there are two divisions of diploma programs: Main Stream (MS) and Extended Stream (ES). The ES division is designed to assist students who have great potential but have inadequate knowledge to succeed in their diploma programme. Diploma programme applicants are required to take the Standardized Assessment Test for Access and Placement (SATAP), and students' SATAP scores determined which division of they will be placed in. A bulk quantity of tablets was purchased from the fund allocated for the betterment of ES education. These tablets were supplied to all ES students and lecturers in the Department of Information and Communication Technology (ICT) and the Department of Electrical Engineering (EE) in 2014. As such, this study focused exclusively on the ES students' use of tablets in the university classroom.

Population and Sample

The targeted participants for this study were students, lecturers, and managers. A total sample of 155 students (89 male and 66 female) comprised of ICT and EE students from a population of 254 and a sample of 14 lecturers (nine male and five female) comprised of ICT and EE lecturers from a population of 25 voluntary participated in the survey. A total of 18 students from the ICT and EE cohorts were interviewed. A total of five lecturers from the ICT and EE departments were interviewed. Additionally, a total of nine managers were

interviewed. Because the EE department was located in the same building as the ICT department, where the main researcher works as a lecturer, it was convenient for him to approach the lecturers and students in both departments.

Data Collection Instruments

The researchers created two 5-point Likert-scale questionnaires, one for students and one for lecturers. The scale ranged from *strongly disagree* (1) to *strongly agree* (5). The questionnaire for students and lecturers consisted of two sections each. The first section of each questionnaire was used to collect demographic data for participants. A total of six items were included in each questionnaire. In order to create the questionnaire, the researchers used various sources. Because the ways students were learning using tablets at the university level and at the pre-university level was similar, the researchers started with an in-depth study on the literature at both levels, which assisted in the development of the questionnaire. Some of the items in the questionnaire were modified from studies in the literature review, including Ağır (2015), McBeth et al. (2015), Rossing et al. (2012), Diemer et al. (2012), Shen (2016), and Mango (2015). The Likert-scale questionnaire of the current study was checked for content validity after the pilot study. The Cronbach's alpha reliability of students and lecturers was calculated, and the results were 0.807 and 0.733, respectively.

A total of three, five, and four key interview questions were used to collect the data from students, lecturers, and managers, respectively. A thematic approach was used to analyze the interview responses, and the results were triangulated to confirm the findings. The data were analyzed using some major themes and subthemes to understand in-depth knowledge on the use of tablets for learning in the classroom.

Data Collection Procedures

Before the commencement of the main study, the main researcher conducted a pilot study for the survey with five students and five lecturers. He also conducted pilot interviews with three students, three lecturers, and three managers to practice questioning, listening, and recording to ensure the accuracy, consistency, and smooth running of the interviews. The participants who participated in the pilot study were not involved in the main study.

Ethical clearance was obtained from the university to collect data from participants. The main researcher arranged a few qualified, trained academics to administer the questionnaire to students in order to decrease bias. Before all trained academics started administering the questionnaire, the main researcher visited the classroom and explained the consent form and the study, emphasizing that their participation was voluntary and that the data collected would be confidential and anonymous. All of the students completed the questionnaire before the specified time, and the response rate was 100%. The main researcher emailed the questionnaire to all the lecturers and collected the responses from

them after sending reminders through WhatsApp, personal messages, and phone calls (the response rate was 64%).

Because the main researcher was located on-site, his office was used to conduct the interviews of students, lecturers, and a few managers such as heads of various departments and deans. Remaining managers such as e-learning specialists, e-learning administrators, extended programme coordinators, and institutional head of extended programme coordinator were interviewed in their offices for their convenience. Interviews were recorded using a high-quality smartphone. Professional audio-recording software installed on a laptop was also used as a secondary measure to ensure that no information was lost. The researchers followed all ethical research practices to ensure that respondents were not mistreated emotionally or physically during the interview.

Data Analysis

Quantitative data were entered manually into Statistical Package for Social Sciences (Version 24) and were analyzed using descriptive and inferential analysis. Categorical variables of quantitative data were compared and tested using an independent samples *t*-test to compute frequency tables and descriptive statistics. A *p*-value of < 0.05 was considered to be statistically significant. Qualitative data were transcribed and analyzed using thematic analysis to generate major themes and subthemes for the research question.

Findings

Quantitative Findings

Table 1

Triangulation of Descriptive Analysis of Students' and Lecturers' Survey Responses for Learning

Item	Item description	<i>n</i>	Disagree	No opinion	Agree
S1	Tablet activities motivated me to learn the course material more than the class activities that did not use tablet.	152	41 (27%)	28 (18.4%)	83 (54.7%)
L1	Tablet activities motivated students to learn the course material more than the class activities that did not use tablet.	14	5 (35.7%)	3 (21.4%)	6 (42.8%)
S2	Tablets helped me to participate more in class during the tablet activities than during activities	155	53 (34.2%)	29 (18.7%)	73 (47.1%)

	that did not use tablet.				
L2	Tablets helped students to participate more in class during the tablet activities than during activities that did not use tablet.	14	3 (21.4%)	1 (7.14%)	10 (71.4%)
S3	Tablets made it easier for me to understand the topics using tablets when I learn in a group.	154	21 (13.6%)	8 (5.2%)	125 (81.1%)
L3	Tablets made it easier for students to understand the topics using tablets when they learn in a group.	13	1 (7.6%)	4 (30.7%)	8 (61.4%)
S4	Tablet activities helped me to participate in quiz as a team.	154	39 (25.3%)	34 (22.1%)	81 (52.6%)
L4	Tablet activities helped them to participate in quiz as a team.	14	2 (14.2%)	5 (35.7%)	7 (50%)
S5	Tablets helped me to gather information for the group project work.	155	11 (7.1%)	8 (5.2%)	136 (87.7%)
L5	Tablets helped them to gather information for the group project work.	14	0 (0%)	4 (28.5%)	10 (71.3%)
S6	Tablets helped me in group discussion.	155	13 (8.4%)	6 (3.9%)	136 (87.8%)
L6	Tablets helped them in group discussion.	14	1 (7.1%)	4 (28.5%)	9 (64.2%)

Note. Responses from the questionnaire were collapsed into three categories: disagree (*strongly disagree* and *disagree* responses), no opinion, and agree (*agree* and *strongly agree* responses). Because not all participants (155 students and 14 lecturers) responded to every item, the *n* for each item is included above.

It was observed that 54.7% of students and 42.8% of lecturers agreed for Items S1 and L1, respectively. About 18.4% of students and 21.4% of lecturers were uncertain. Around 1.8% of students did not answer Item S1. The percentage of lecturers who agreed for Item L2 was 71.4%; however, only 47.1% of students agreed for Item S2. About 18.7% of students and 7.14% of lecturers were uncertain. Around 81.1% of the students and 61.4% of the lecturers agreed to Items S3 and L3, respectively. About 5.2% of students and

30.7% of lecturers were uncertain. However, 7.2% of lecturers did not respond to Item L3. The percentage of students and lecturers who agreed for Items S4 and L4, respectively, was around 50%. About 22.1% of students and 35.7% of lecturers had no opinion. Additionally, 87.7% of students and 71.3% of lecturers agreed for Items S5 and L5, respectively. About 5.2% of students and 28.5% of lecturers were uncertain. Likewise, 87.8% of the students and 64.2% of the lecturers agreed for Items S6 and L6, respectively. About 3.9% of students and 28.5% of lecturers had no opinion.

An independent sample *t*-test was conducted to compare the views of students and lecturers at a 5% level of significance (i.e., $\alpha = 0.05$). The results showed that there was no significant difference ($t(167) = 0.566, p(2\text{-tailed}) = 0.572$) in the views of students ($M = 25.12, SD = 4.926$) and lecturers ($M = 24.36, SD = 3.835$). The difference in the means was 0.765 with 95% CI (-1.907 to 3.437). Therefore, the views of students and lecturers were the same on the effectiveness of tablet use for learning in university classrooms, and it had an equal effect on all participants.

Qualitative Findings

In order to refer to interview participants, the 18 students are referred to as Students 1–18, the five lecturers are referred to as Lecturers 1–5, and the nine managers are referred to as Managers 1–9. The major theme that was generated after data collection was the effectiveness of tablet use for learning. The three subthemes that emerged from the major theme after triangulation were engagement and collaboration, curriculum change for tablets, and enhancement of skills.

Regarding the first subtheme, engagement and collaboration, students engaged and collaborated with their classmates using different social networking applications for learning purposes. Students 1, 3, 6, and 17 stated that they communicated and collaborated with their classmates only when they could access wi-fi or the internet. Even though they were in group discussions, most of them had issues accessing the internet because of the inability to use SIM cards in their tablets. Internet or wi-fi was accessible to them only when they were on campus. Student 11 stated, “We are discussing some topics that we have been given by the lecturer so that we will be getting some new things from one another with the help of tablets.” Unlike their peers, Students 2, 5, and 18 did not believe that there was active collaboration between classmates. The lecturers all agreed that tablets helped students to engage and collaborate with their classmates for the purpose of learning. Lecturer 1 indicated that students created a WhatsApp group for their class; thus, even if students were not on campus, they could still communicate with each other and share the handouts in WhatsApp. According to Lecturer 2, if the lecturer gave a task to one student to pass on to the others, they would share and discuss the task on WhatsApp using tablets and later meet physically as a group.

Regarding the second subtheme, curriculum change for tablets, most of the lecturers suggested that changes must be made in the way that topics were delivered using tablets in class but not in the curriculum. Lecturer 3 stated, “No. No need to make changes in the curriculum. Whatever we are using that must be in line with the technology.” Lecturer 1 stated, “It is a tool that is not changing the content. So if needs for the content to be changed, then it should be for the other reasons but not for tablets.” On the other hand, Lecturer 2 thought that the curriculum needed to be changed for the tablets. The majority of the managers were also in agreement with the lecturers that the curriculum need not be changed but that the change should be in the way that the curriculum was delivered. Manager 4 stated, “I don’t think that curriculum needs to be changed. Because I think the curriculum has its own learning outcomes. I think what needs to change is the way that the curriculum is delivered and also the way it is accessed.” Manager 3 also had a similar view: “I don’t think curriculum needs to be changed, but because [the] tablet is just a tool to learn just like a book, which you have lot textbooks or a reading material.” Conversely, two respondents, Managers 5 and 8, thought that the curriculum needed to be slightly modified.

Regarding the third subtheme, enhancement of skills, the majority of students had a positive experience because it had enhanced their skills and learning capabilities. Student 4 stated, “I start learning how to connect to wi-fi; I start learning to access other applications through the internet. So I think I do learn something when you get those tablets.” Students 2, 5, 6, 7, 10, and 16 corroborated the view of Student 4: that their learning was enhanced by using tablets to access the internet. Student 3 was fond of reading notes on tablets. However, Students 8 and 18 had a negative impression of tablet use. Student 8 stated that because tablets did not have SIM card slots, it was difficult to access the internet all the time. Moreover, Student 18 preferred using hard copies to read notes. All the lecturers thought that tablets had enhanced students’ learning capabilities and developed their skills after the adoption of tablets. Lecturer 1 stated, “They can do the assignments in their comfort zone.” Lecturer 3 corroborated with the view of Lecturer 1 by mentioning that “they are having the blackboard, or in other words Wiseup, so it’s easy for them to access their assignment, and they can respond.” Whereas Lecturer 4 stated that students had started reading e-books using tablets, Lecturer 2 emphasized that the tablet was a tool that had not only advantages but also disadvantages. Managers also had a positive response regarding the enhancement of students’ skills. Manager 3 stated, “I would like to think that it has enhanced students’ skills. Because it has also shown the throughput rate has improved. So it should have definitely improved students’ skills.” Managers 4 and 6 also supported the view of Manager 3.

Discussion

Survey Responses

The survey responses revealed that both students and lecturers agreed that tablet activities motivated students to learn the course material more than the class activities that did not use tablets (Items S1 and L1). Diemer et al. (2012) and Rossing et al. (2012) indicated that tablet activities motivated students to learn the course material. Mango (2015) averred that the use of iPad tablets motivated students to participate in class activities. Ağır (2015) and Chou et al. (2012, 2014) stated that the use of tablets increased motivation to learn. Therefore, findings of the current study were stable with the views of Diemer et al. (2012), Mango (2015), Ağır (2015), Chou et al. (2012, 2014), and Rossing et al. (2012). Most of the students in the current study felt that tablets helped them to participate more in class during the tablet activities than during activities that did not use tablets (Items S2 and L2). This is similar to the results found by Rossing et al. (2012) and Diemer et al. (2012), who found that tablets helped students to participate more than usual in the classroom. There was unanimous agreement from students and lecturers that tablets made it easier for students to understand the topics when they learn in a group (Items S3 and L3). The findings of this study coincide with the findings of Rossing et al. (2012) and Diemer et al. (2012), who stated that students found it easier to learn in a group using tablets. The study found that tablet activities helped students to participate in online quizzes as a team (Items S4 and L4). The majority of the students and lecturers agreed that tablets helped students to gather information for the group project work (Items S5 and L5). Although Ağır's (2015) findings were similar to the findings of the present study, Hahn and Bussell's (2012) findings were not because the students in that study had difficulty using tablets to access course content due to compatibility issues. Furthermore, this study showed that tablets helped students in group discussion (Items S6 and L6). Rossing et al. (2012) also indicated that students' participation in class discussion and group discussion increased after the adoption of iPad tablets. Ağır (2015) asserted that tablets helped students to join in the discussion. Therefore, the results of the current study are similar to studies by Rossing et al. (2012) and Ağır (2015).

Interview Responses

In the interviews, students' and lecturers' responses echoed the survey findings that students engaged and collaborated with their classmates by making use of different social networking applications such as Facebook, Twitter, and WhatsApp for the purpose of learning. Chou et al. (2012) concurred that "mobile devices such as iPads increase student engagement; teachers have commented that the students were 100% on tasks and engaging in classroom discussions" (p. 21). McBeth et al. (2015) indicated that 56% and 63% of the respondents' concurred with the notion of engagement and collaboration, respectively. Therefore, the results of the present study are consistent with the

findings of Chou et al. (2012, 2014) and McBeth et al. (2015). Lecturers and managers disagreed with the idea of changing the curriculum for the use of tablets. They stressed that changes must be made in the delivery of lectures but not in the curriculum. This is contrary to Ađır's (2015) findings that current curricula should be changed for effective iPad use. All of the stakeholders in this study agreed with the statement that tablet use had enhanced the skills of students. This finding is consistent with Rossing et al. (2012) and Diemer et al. (2012), who found that the use of tablets enhanced the skills of students.

Conclusion

All stakeholders in this study showed positive attitudes about students' use of tablets for learning in the classroom. The findings also showed that there was no significant difference between the views of students and lecturers on the use of tablets for learning. Students' motivation to learn increased after the adoption of tablets. Tablets enabled students to be active in the classroom. Students also began to communicate actively with their peers and lecturers, both inside and outside the classroom. Overall, students and lecturers felt that learning was enhanced significantly after the implementation of tablets.

Limitations and Recommendations for Further Research

This study was not without its limitations. The students and lecturers in the study were only from the ICT and EE departments. There was no study conducted with groups of students from other departments in the same university to evaluate the difference in the results. It is expected that the findings from this study will stimulate further research in other areas such as the strengths and weaknesses of tablet use by students and lecturers in universities as well as learners and teachers in the schools.

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