

Exploring Students and Lecturers Perceptions on Tablet Use for Learning in a South African Rural University

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Received August 30, 2021; Revised October 21, 2021; Accepted November 11, 2021

Cite This Paper in the following Citation Styles

(a): [1] Simon Christopher Fernandez , "Exploring Students and Lecturers Perceptions on Tablet Use for Learning in a South African Rural University," *Universal Journal of Educational Research*, Vol. 9, No. 12, pp. 1928 - 1934, 2021. DOI: 10.13189/ujer.2021.091205.

(b): Simon Christopher Fernandez (2021). *Exploring Students and Lecturers Perceptions on Tablet Use for Learning in a South African Rural University*. *Universal Journal of Educational Research*, 9(12), 1928 - 1934. DOI: 10.13189/ujer.2021.091205.

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Abstract Tablets are rapidly growing pervasive, influencing all age groups of people especially adolescents. Utilizing quantitative methodology, this study sought to explore the perceptions of students and lecturers on using tablets for learning at a rural university located in the Eastern Cape state of South Africa. A descriptive case study research design was employed. A sample of 155 from a population of 254 students and 14 from a population of 25 lecturers voluntarily participated in the survey. Data collected from the structured questionnaires were captured into Statistical Package for Social Sciences (version 24). Quantitative data were analysed using descriptive and inferential analysis. Data collected from both stakeholders were triangulated by sources to confirm the findings. The results revealed that students answered the exercise questions, developed the projects and started to search concepts in detail after getting tablets. Although a statistically significant difference was there between the perceptions of students and lecturers, both stakeholders showed positive attitudes toward the students' use of tablets for learning in university classrooms. The study recommended that lecturers must provide more tablet related learning tasks to students in order to make them accept tablet as a learning tool and lecturers must ensure regularly that those tasks are done effectively.

Keywords Tablet Computers, Learning, University, Educational Technology, Mobile Technology, Rural University Education, Lecturers Perceptions, Students Perceptions

1. Introduction

The past decade has witnessed the technological advancement of many digital gadgets such as tablet computers, smartphones and iPads. The rapid growth of these mobile technologies is influencing people in all fields especially in education [1]. Students are using these technologies for being online to perform mobile learning both inside and outside the classroom [2, 3]. More opportunities are formed for tertiary students to enhance their learning due to the growth of these mobile technologies [4]. Among all the mobile devices, tablet is the fastest development tool which has made an impact on education in the United States [5]. Students in higher education institutions are very quick in adopting tablets [6].

Despite tablets were made not for education, they have thrived to become an education tool [7] because of their ability to make a classroom paperless [8]. Many institutions around the world are purchasing a large quantity of tablets for the purpose of students learning [9]. As tablet is an inexpensive tool for engagement and collaboration, many universities all over the globe are integrating this device into their curriculum [10, 11].

Green et al. [6] conducted a study in Australian metropolitan university and found that students are bringing tablets to the university and they are using them

for learning. Tablet enhances engagement between students and lecturers and improves the critical thinking and creativity of students [12]. It is an effective tool not only for the lecturers to prepare lectures and deliver presentations but also to have collaboration and active learning within the classroom among students [13].

There are investigations in which students used tablets for non-educational purposes too. A study conducted by Karalar and Sidekli [7] in Turkey showed that students used tablets for playing games, watching videos and used tablets to read eBooks rarely. A research conducted in Canada also showed that students had similar opinions. Even though they highlighted the positive sides, they did not fail to emphasize the distractions that were being caused by other students due to their non-educational use of tablets [14].

As indicated in the aforementioned literature, many universities all over the globe have integrated tablets in classroom and the majority of the former studies emphasized exclusively on the applications that are installed on tablets for learning [15,16,17,18]. It cannot be assured that learning applications on tablets will certainly make students use them for mobile learning [19]. Furthermore, the studies on students learning using tablets are inadequate [19, 15] especially in a developing country like South Africa that too from lecturers and students' perspectives. "As a key link between students and the institution, lecturers play a vital role in mediating students' expectations and learning experiences" [21, p. 47]. Lecturers play a vital role not only in steering the students on their use of tablets but also in permitting as well as preventing internet access using tablet [22, 23]. Therefore, a detailed study is highly essential to examine the perspectives of lecturers and students on using tablets in the university classrooms. Moreover, the similar study is not popular in the Eastern Cape state of South Africa where the study was conducted. In the light of this, a study to collect and analyse the students' and lecturers' perspectives on tablet use for learning from a South African perspective is a pertinent problem that needs to be investigated.

The purpose of the study was to explore the perceptions of students and lecturers on using tablets for learning at a rural university located in the Eastern Cape State of South Africa. This study was guided by the following research question: How do students and lecturers vary in their perceptions on using tablet for university learning?

1.1. Literature Review

A very recent study was conducted by Narayan and Naidu [24] in the University of South Pacific to evaluate the students' usage of tablet computers for learning. A mixed method approach was adopted in that study. While 352 students participated in the survey, five students participated in the in-depth interview. Findings revealed that students were favourable towards the use of tablets in

learning as it assisted them to access their learning materials very easily, engage and collaborate with their classmates as well as with their lecturers.

Percival and Claydon [14] were recognised to determine perceptions of the use of tablets by students both for their personal life and for education in the University of Ontario, Institute of Technology. A total of 50 students were selected randomly to participate in a survey that included both Likert scale and open ended qualitative questions. The result showed that participants were impressed with the portability of tablets, convenience to replace textbooks with tablets, easy ways to search study materials during class and particularly for taking notes. On the other hand, the students agreed that their primary usage with tablets was for entertainments specifically social networking and games which distracted other students in the classroom.

A study was conducted in an education college in South Western, United States to determine the lecturers' views on their use of technology (Tablets especially iPads) for educational purposes and their students' competency on technology. Utilizing qualitative method approach, eight faculty members were interviewed. A purposive sampling technique was employed in this study. Findings showed that almost all the participants indicated that their current students were technology competent and they were very quick and better at learning a new application than the former students. However, students also used their devices for off-task behaviours such as visiting social networking sites during class hours [25].

Similarly, another research was conducted in an American university where 115 teacher candidates participated in the online survey. The aim of the research was to assess the benefits and challenges they have faced and how tablets were used effectively for learning purposes. The questions in the online survey were based on their involvement and its impact of using tablets in their courses. Overall, they had positive experiences in using a variety of apps for different learning activities. They acquired more skills and knowledge through the use of tablets which made them more confident in their studies [26].

McBeth, Turley-Ames, Youngs, Ahola-Young and Brumfield [27] focused on the use of mobile technology in the classroom using tablets. They assessed 118 students who were enrolled in a tablet Pilot project which was sponsored by Idaho State University in the intermountain western United States. This project was started with an intention that students need exposure to technology as a collaborative device not to substitute but to compliment the interaction between humans. The web portal "Survey Monkey" was used for the survey, and the link was sent to the faculty to share with students. The researchers had observed a pedagogical challenge that a significant number of students who had the least exposure to technology were from the rural areas cannot find the importance of technology in their daily lives and were

struggling to use the new technologies. Conversely, other groups of students reported that the use of tablets assisted them with multiple learning styles, enhanced their research skills, involvement in classroom and critical thinking.

A study was conducted to explore the university students' preferences and barriers to use tablet for learning. Using qualitative method approach, 20 students were interviewed and 343 students responded to the open-ended questionnaire. Findings showed that their preferred ways were to complete their academic tasks, to engage in online discussions, to search and learn through online platforms. Furthermore, their barriers were distraction, features of mobile device, limited support and resources [28].

A collective case study designed at St Mary's Health Care System in Athens Georgia sought to understand how tablets helped medical students in learning and adapting it in professional practice. Interviews and classroom observation were used in the data collection. Around 36 students of the third year participated in the study. As this study was an exploratory collective case that consisted of three stages and has finished only the first stage, the researcher had only initial data at this point and a long period of data collection had to be done in future. Preliminary findings showed that students were motivated and benefited from the use of technology. The majority of the medical students were using tablets to access the information of the patients when they were going for the rounds [29].

2. Materials and Methods

2.1. Research Approach and Design

The research adopted a quantitative approach and employed a descriptive case study research design.

2.2. Study Site

Data were collected from one of the campuses at a rural university located in the Eastern Cape state of South Africa. The justification for choosing this university as the study site was mainly due to the fact that at the time of data collection, only in this university tablets were offered to the students for learning purposes.

2.3. Population and Sample

A sample of 155 students (89 males; 66 females) from a population of 254 and another sample of 14 lecturers (9 males; 5 females) from a population of 25 voluntarily participated in the survey. Both stakeholder cohorts were selected from the departments of Information and Communication Technology and Electrical Engineering. All members of the sample were surveyed. Two separate questionnaires for each of the stakeholder cohorts provided the core data. The justification for choosing the

participants from Information and Communication Technology and Electrical Engineering cohorts was purely based on the convenience of the researcher as he was also working in the same block in the same university.

2.4. Data Collection Instrument

Two 5-point Likert scale questionnaires were developed for each stakeholder cohort. Both questionnaires were comprised of two sections in which the first section included the demographic questions and the second section included six questions on the perceptions of students and lecturers on using tablets for university learning. The scale has five levels in which level 1 being "STRONGLY DISAGREE", level 2 being "DISAGREE", level 3 being "NO OPINION", level 4 being "AGREE" and level 5 being "STRONGLY AGREE". Some of the items in the questionnaire used by Agir [30] in his study were modified and used in this research.

2.5. Validity and Reliability

Pilot studies were conducted with five students and five lecturers separately who were not part of the main study to measure the validity of the questionnaire. The response received from the pilot study made the Likert-scale questionnaire more perfect. As it was a scale with items less than 10, mean inter-item correlation was calculated to test the internal consistency of the scale for students and lecturers and found to be 0.5 and 0.154 respectively. Mean inter-item correlation value between 0.15 to 0.5 can be considered as an optimal result [31].

2.6. Ethical Compliances

Ethical clearance was obtained from the concerned authorities to collect and analyse the data. Signed consent forms were obtained from all the participants before the commencement of the data collection.

2.7. Data Collection Procedure and Data Analysis

The students' questionnaire in the main study was administered by a few academic colleagues of the researcher to make the data bias less. The researcher visited the classrooms before the commencement of administering the questionnaire and explained to the students about this study and the consent form. Although all information was there in the consent form, the researcher still informed them that their participation would be voluntary and their responses would be confidential and anonymous. The questionnaire for lecturers was emailed and reminders were sent to them in the form of WhatsApp and personal messages. While the response rate of students was 100%, response rate of lecturers was only 56%. The data were collected from both stakeholders at the end of 2017. The researcher captured the data manually into Statistical Package for Social Sciences (SPSS version 24) and they were analysed

using descriptive and inferential statistics. Data collected from both stakeholders were triangulated by sources to confirm the findings. Categorical variables of the surveyed data were compared and tested using the Independent Samples t-test to compute frequency tables and descriptive statistics. A p-value <0.05 was considered to be statistically significant.

3. Results

It can be seen that 31.8% of the students strongly disagreed and 23.6% of them disagreed that they started to solve puzzle kind of exercises after getting tablet (item S1). Around 31.8% of the students agreed and 12.8% of them strongly agreed on item S1. About seven students did not answer. While 15.3% of the lecturers disagreed on item L1, more than half (53.9%) of the lecturers were uncertain. Around 23% of the lecturers agreed and 7.8% of them strongly agreed on item L1 and only one lecturer did not answer.

It was observed that 13.4% of the students strongly disagreed and 38.3% of them disagreed that they started to create presentations in class after getting tablet (item S2). About 30.9% of the students agreed and 17.4% of them strongly agreed on item S2. Around six students did not attend item S2. While 7.1% of the lecturers disagreed on item L2, 28.7% of them were uncertain. About 57.1% of the lecturers agreed and 7.1% of them strongly agreed on item L2.

Around 12% of the students strongly disagreed and 18.1% of them disagreed on item S3 that they started to do homework. More than one-third (38.2%) of students

agreed and 31.7% of them strongly agreed on item S3. About six students did not answer item S3. On the other hand, 7.1% of the lecturers disagreed on item L3 and 50% of them did not have any opinion. Approximately 35.8% of them agreed and 7.1% of them strongly agreed on item L3.

Out of 148 students who answered item S4, 10.1% of the students strongly disagreed and 25% of them disagreed that they started to answer the exercise questions. About 35.9% of the students agreed and 29% of them strongly agreed on item S4. Furthermore, seven students did not answer item S4. Around 21.4% of the lecturers disagreed and 28.6% of them were indeterminate on item L4. While 42.9% of lecturers agreed, 7.1% of them strongly agreed on item L4.

While 21% of the students strongly disagreed and 27.9% of them disagreed that they started to develop projects after getting tablet (item S5), 28.7% of the students agreed and 22.4% of them strongly agreed on item S5. Around eight students did not answer item S5. On the other hand, while 28.6% of the lecturers disagreed on item L5, 21.4% of lecturers agreed and another 21.4% of them strongly agreed on item S6. About 28.6% of the lecturers were indeterminate.

Furthermore, it was observed that 12.2% of the students strongly disagreed and 27.2% of them disagreed that they started to search concepts in detail (item S6). Around 37.5% of the students agreed and 23.1% of them strongly agreed on item S6. About eight students did not attend item S6. While a minority of the lecturers (8.3%) disagreed on item L6, half of the lecturers (50%) agreed and 16.7% of them strongly agreed on item L6. One quarter of the lecturers (25%) did not have any opinion.

Table 1. Triangulation of Students and Lecturers perception on students' use of tablets for learning in rural university classrooms

#	ITEMS	SD	D	NO	A	SA	N	NA
S1	After getting tablet, I started to solve puzzle kind of exercises.	47 (31.8%)	35 (23.6%)	0 (0%)	47 (31.8%)	19 (12.8%)	148 (100%)	7
L1	After getting tablet, students started to solve puzzle kind of exercises.	0 (0%)	2 (15.3%)	7 (53.9%)	3 (23%)	1 (7.8%)	13 (100%)	1
S2	After getting tablet, I started to create presentations in class.	20 (13.4%)	57 (38.3%)	0 (0%)	46 (30.9%)	26 (17.4%)	149 (100%)	6
L2	After getting tablet, students started to create presentations in class.	0 (0%)	1 (7.1%)	4 (28.7%)	8 (57.1%)	1 (7.1%)	14 (100%)	0
S3	After getting tablet, I started to do homework.	18 (12%)	27 (18.1%)	0 (0%)	57 (38.2%)	47 (31.7%)	149 (100%)	6
L3	After getting tablet, students started to do homework.	0 (0%)	1 (7.1%)	7 (50%)	5 (35.8%)	1 (7.1%)	14 (100%)	0
S4	After getting tablet, I started to answer exercise questions.	15 (10.1%)	37 (25%)	0 (0%)	53 (35.9%)	43 (29%)	148 (100%)	7
L4	After getting tablet, students started to answer exercise questions.	0 (0%)	3 (21.4%)	4 (28.6%)	6 (42.9%)	1 (7.1%)	14 (100%)	0
S5	After getting tablet, I started to develop the project.	31 (21%)	41 (27.9%)	0 (0%)	42 (28.7%)	33 (22.4%)	147 (100%)	8
L5	After getting tablet, students started to develop the project.	0 (0%)	4 (28.6%)	4 (28.6%)	3 (21.4%)	3 (21.4%)	14 (100%)	0
S6	After getting tablet, I started to search concepts in detail.	18 (12.2%)	40 (27.2%)	0 (0%)	55 (37.5%)	34 (23.1%)	147 (100%)	8
L6	After getting tablet, students started to search concepts in detail.	0 (0%)	1 (8.3%)	3 (25%)	6 (50%)	2 (16.7%)	12 (100%)	2

Note. # = item number, S = Student, L = Lecturer, SD = Strongly Disagree, D = Disagree, NO = No opinion, A = Agree, SA = Strongly Agree and N = Total Answered.

Table 2. Independent Samples t-test

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
TOTALSC ORES	Equal variances assumed	.000	.983	-4.007	167	.000	-4.813	1.201	-7.184	-2.442
	Equal variances not assumed			-3.816	15.166	.002	-4.813	1.261	-7.499	-2.127

An independent samples t-test was conducted to compare the perceptions of students and lecturers at a 5% level of significance (i.e., $\alpha = 0.05$). There was a statistically significant difference in perceptions of students ($M=15.19$; $SD=4.283$) and lecturers ($M=20.00$; $SD=4.540$; $t(167) = -4.007$). The observed p-value (2-tailed) was 0.000 which is less than the level of significance (0.05). The magnitude of the differences in the means was -4.813 with 95% CI: -7.184 to 2.442. Therefore, the results show that perceptions of students and lecturers are not the same on using tablets for university learning.

4. Discussion

The majority of the students did not solve puzzle kind of exercises after getting tablets. However, many of the lecturers were uncertain. McBeth et al. [27] averred that only a minority of the students used tablets to solve puzzles. Jain [32] conducted a study on how the use of Information and Communication Technology (ICT) elements can be used in teaching English literature and excite students and academics to bridge the digital divide. Jain [32] stated that literacy criticism or literary studies using ICT will be interesting through practical exercises. Therefore, although the findings of the current study obtained from students are stable with the perceptions of McBeth et al. [27], oppose to perceptions of Jain [32]. As per the view of researcher, this discrepancy between the perception of students and lecturers could be because lecturers may be insisting the students to do the puzzle kind of exercises to develop their level of concentration and skills such as critical thinking and problem solving and thereafter lecturers may not be checking whether they are solving them or not. Students know that lecturers usually do not check these exercises of students which may lead students to have less interest in solving puzzle kind of exercises.

Despite lecturers assert that students used tablets for the purpose of presentations, students had a different opinion that they did not use tablets to create presentations in class. Students' perception is parallel with the results by Agir

[30] who stated that "students do not prefer to use the iPad for making presentations". However, lecturers' perception contradicts with the findings by Agir [30] and is stable with the results of Henderson [33] who stated that academics integrated digital technologies in the learning and teaching to reduce the digital divide and students were competent well to prepare the PowerPoint presentation and execute the task. Lecturers know that using tablet for presentations is a vital skill that every student should possess as it helps them to have confidence in their subject. Students' current perception may change when they create more presentations in class using tablets.

While the majority of the students agreed that they have started doing homework after getting tablets, most of the lecturers were uncertain. Gong and Wallace [34] indicated that students were using tablets to search for information for doing homework. Dundar and Akcayir [35] also supported the fact that tablets aid students to do the homework. A study conducted by Mendicino, Razzaq and Heffernan [36] suggested that as the digital divide contracts, the openings for the students to do their homework widens. The perception of students is similar to the findings by Gong and Wallace [34], Dundar and Akcayir [35] and Mendicino, Razzaq and Heffernan [36]. According to the researcher of the current study, lecturers' uncertainty shows that they are not checking whether students are doing the homework or not. Usage of tablets to do homework helped to narrow down the digital divide among students.

The study revealed that both stakeholders had a common opinion that students started to answer exercise questions after getting tablets. This is in parallel with the results of Enriquez [37] who affirmed that students used tablets to solve the exercises which were given by their lecturers at the end of each lecture. The researcher of the current study views that it will be always convenient for the students to submit their answers and lecturers to examine students' submitted work.

The result found from the present study showed that after getting tablets, students started to develop their projects. Kozma, McGhee, Quellmalz and Zalles [38] conducted a study to close the digital divide between developed and developing countries on their use of

computers to prepare students for the global workforce. They found that students gained skills by engaging in activities such as collecting data for research and student collaboration for the research projects. The finding of this study is stable with the findings by Kozma, McGhee, Quellmalz and Zalles [38] and Agir [30] who indicated that students used their tablets to work on projects with their classmates. As tablets are easy to handle, it will also be convenient for the students to develop their projects as and when they require.

The study established that students preferred to use their tablets for searching the concepts in detail. Pagan, Martinez and Maiquez [39] conducted a study on the digital divide in viable forms of development for education and found that majority of the students felt internet technology as a useful tool to search and access the information. McBeth et al. [27] also obtained a similar finding that the majority of students used their tablets to discover and explore the educational concepts. Students can explore each and every concept in detail from anywhere and at any time by searching in the internet using tablet.

5. Conclusions

The study could be concluded from the findings that both students and lecturers showed positive attitudes on students' use of tablets for learning in rural university classrooms. Students answered the exercise questions, developed the projects and started to search concepts in detail using tablets. However, there was a statistically significant difference between the perceptions of students and lecturers.

Among three limitations, first and foremost is the size of the lecturers who participated in the survey was only 14. Secondly, both stakeholders were selected only from the departments of Information and Communication Technology and Electrical Engineering. It would have been better if more lecturers were included in this study from other departments as well to know their perception which would also help to increase the sample size. Finally, the number of survey items used in the study was only six. It would have offered a broad examination if there were some more items.

The study recommended that lecturers must provide more tablet related learning tasks to students in order to make them accept tablet as a learning tool and lecturers must ensure regularly that those tasks are done effectively on time.

The results of this study are expected to stimulate further research on other areas such as a comparison between students' use of tablets in university and students' use of tablets in school.

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