Students Views on the Benefits and Drawbacks of Using Tablets: A South African Case Study

Simon Christopher Fernandez[1,a,*]

[1]*Department of Applied Informatics and Mathematical Sciences, Walter Sisulu University, East London, South Africa*
[a]*wsusimon@gmail.com*
*Corresponding author

Abstract: The aim of the research was to explore the views of students on the benefits and drawbacks of using tablets at a rural university located in the Eastern Cape province of South Africa. The study adopted qualitative method and employed a case study research design. A total of 155 students from a population of 254 voluntarily partook in the study. The instrument used to collect the data was an open-ended questionnaire. Thematic analysis was used to analyse qualitative data. Findings showed that while students had benefits in the case of learning, doing research and user-friendliness, they also had drawbacks such as distractions, taking photos and watching videos. Overall, it should be understood that every technological device has benefits and drawbacks, so in tablets as well. Therefore, if the students can behave maturely and avoid the off-task behaviours, tablets can be considered as a very effective tool for the learning purpose.

1. Introduction

Education has a very important role in the development of our society from a very early stage. Institutions in this epoch are progressing drastically by integrating the newly innovative technologies in the classrooms [1, 2]. The evolution of Information and Communication Technology has helped the institutions to offer a better education to students [3]. Internet access has been provided by the tertiary institutions for the students and lecturers to utilize all tools such as tablets, laptops, desktop computers, projectors etc for an active teaching and learning [4]. These technologies are playing a huge role in bringing education to an upper level [5]. The devices such as smart phones and tablets can motivate the learning interest in students not only in pre-university [6, 7, 8] but also in university [9, 10]. This enables students to develop a collaboration with their classmates and educators and make a better learning atmosphere [11]. Moreover, the students in this generation are more familiar with digital technologies when compared with educators [12].

The emergence of tablet computers such as Galaxy (developed by Samsung Inc.) and iPad (developed by Apple Inc.) into the electronic market have made a greater impact everywhere. These tablets are introduced in order to overcome the challenges experienced with the previous mobile

devices such as smartphones and laptops [13]. Many students agree that selecting apps by themselves in tablet computers have boosted their engagement and collaboration between each other [14].

Many authors have concurred about the wide range of benefits on using tablets in the classroom such as reading articles, searching information during discussion and saving lecture notes [15]. Alsufi [16] and Sheppard [17] aver that students will benefit, as they do not need to buy costly textbooks, which can be downloaded from the internet. Ludwig and Mayrberger [18] suggest that students who regularly use tablets are extremely interested in collaborating with their classmates.

Despite the potential benefits of tablets, many researchers have pointed out various drawbacks. Kinash, Brand and Mathew [19] emphasise the off task attitudes of students such as visiting social networking sites, chatting with friends and taking pictures which make students to deviate their concentration from the lecture contents. Niemeijer, Donnellan and Robledo [20] posit that many institutions often purchase tablets in large numbers without a proper plan. This may lead to a situation where students and lecturers do not realize the value of money and education. Fischman and Keller [21] argue that tablet computers are not as user-friendly as laptops. This might be a challenge for students to perform their tasks.

1.1. Problem Statement

In the light of the literature shown in the background, it is clear that integration of tablet technology into classrooms has become ubiquitous. However, there is a lack of studies on the students' use of tablets for learning [22]. Moreover, there is a paucity in the areas of research that needs to be investigated such as how the use of tablets enhance or hinder student learning [23] and whether tablets can make any influence in education [24]. Additionally, little studies have been done in the higher education institutions of South Africa pertaining to the students' views on the use of tablets as a learning device [25]. Therefore, a study on the views of students on the benefits and drawbacks of using tablets in a South African university is a pertinent problem that needs to be investigated.

1.2. Aim of the Research

The aim of the research was to explore the views of students on the benefits and drawbacks of using tablets at a rural university located in the Eastern Cape province of South Africa. The key research question is: What are the views of students on the benefits and drawbacks of using tablets in university classrooms?

2. Literature Review

A study conducted in United Arab Emirates explored the views of 194 students from two Higher Colleges of Technology to examine the different activities and tasks of using of iPad tablets. Mixed method approach was used for this study. Findings showed that use of iPad tablets had improved engagement between students and enhanced their focus on the activities and tasks for learning using iPad technology [26].

Rumreich [27] conducted a study to investigate the attitudes of students toward iPad tablets, its use in their courses and how its tools can enhance their learning. The participants in the study were 354 first year Engineering students from Ohio State University in the United States of America. A 5-point Likert-type questionnaire was used for this study. Findings indicated that students used their iPads more often for learning activities such as taking notes, watching videos, drawing and course management system tailed by collaboration and reflation activities.

A research conducted in Ghana focussed on students' use of tablets and smartphones and how it is persuading students learning in the university classrooms. The questionnaire was created using Google Form and its link was forwarded to the students whatsapp groups within the university. A total of 180 students partook in the online survey. Findings showed that students used these devices more often for edutainment such as to watch television programmes, to play video games and read other materials that are educational and entertains the students [28].

Cant, Wiid and Enock [25] investigated the views of 277 undergraduate students to understand their use of tablets for the purpose of mobile learning. A quantitative method was used and a semi-structured questionnaire was designed for this approach. The data collected from the online survey were captured through Limesurvey. Findings showed that majority of the students had positive views on the use of tablet computer for university learning.

In a qualitative study conducted in the University of Cape Coast to examine the role of tablets and smartphones in the information-seeking behaviours and information needs of doctoral students for learning, Barfi [29] interviewed 15 doctoral students from the College of Health and Allied Sciences, the College of Agricultural and Natural Sciences, the College of Humanities and Legal Studies and the College of Education Studies. Findings showed that tablets and smartphones made a positive impact on information-seeking behaviour and information needs of students. They generally used these devices to search for some resources in library, some information on Google, download the information and save them for future purposes. Moreover, they were able to perform collaborative learning by sharing the information and transferring the knowledge among the students.

A research conducted to examine the level of tablet ownership of students and their current usage of tablets for learning and non-learning purposes at an Australian metropolitan university showed a high level of ownership of tablets and they had a positive engagement with the tablets for educational purposes. A mixed method research approach was followed to conduct this study. While a sample size of 200 students that comprised of postgraduate and undergraduate students were surveyed, only five students were interviewed. This study found that students used tablets more often in terms of studies for emailing, surfing internet, accessing course materials, reading textbooks and communicating with their group members. Results of this study also showed that students used tablets for non-educational purposes such as to access the social networking sites, watching videos, playing games, listening to music and taking photos [30].

3. Research Methodology

3.1. Research Approach

The study adopted qualitative method research approach because it is more flexible than quantitative method as it aided respondents to express their points while providing the data.

3.2. Research Design

A case study research design was used in the study to obtain the actual, contextual, detailed facts about a particular topic or matter.

3.3. Study Site

The site used for the study was a rural university located in the Eastern Cape province of South Africa. There were no other universities that was using tablets as a learning tool in the province, which made the justification for selecting this university as the study site.

3.4. Population and Sample

A total of 155 students from a population of 254 voluntarily partook in the study. Students were selected from the department of Information and Communications Technology and department of Electrical Engineering. It was convenient for the researcher to collect the data from the students of these departments as they were in the same building, which made the justification for choosing the sample.

3.5. Data Collection Instrument

The instrument used to collect the data was an open-ended questionnaire that comprised of two sections which was created by the researcher himself. While the first section was used to obtain the demographic data of the respondents, second section was used to obtain the core data. A total of five open-ended questions were included in the second section.

3.6. Ethical Compliances

The researcher obtained permission to conduct the study from the university where the research was conducted. The researcher also obtained consent to collect the data from the respondents after they have read the ethical considerations, which were described on the first page of the questionnaire.

3.7. Pilot Study

The questionnaire was piloted and administered to the students by the researcher himself. All the five participants showed positive attitude and willingness to participate in the pilot study and they were not included in the main study. The common feedback which came from all the students in one voice was that all the questions were straight forward, understandable and they have seen no hitches to understand neither any words nor any of the sentences used in the questionnaire.

3.8. Data Collection Procedure

In order to obtain the data from students, it was very important to know their availability as well as of lecturers as it was the lecturers who were administering the questionnaire. Therefore, the researcher had meeting with each and every lecturer who were lecturing these students to find their convenient time and made a chart for not to miss the time permitted to the researcher. Lecturer 1 administered two classes, as she was the responsible lecturer in charge of those classes. She managed to administer the questionnaire in her last period of each class. Lecturer 2 also distributed the questionnaire and collected the data in her last period. However, Lecturer 3 was not ready to sacrifice his class although he was ready to administer. Therefore, he collected the data from his students after the end of his class. Fortunately, the venue was available and students were also free during that time. In order to diminish the bias, the researcher requested Lecturer 4 to administer three classes, as the lecturer of these classes were the researcher himself. Before all lecturers started administering the questionnaire, the researcher visited the classroom and had been there only for two minutes to explain slowly and clearly about the consent form and research.

Researcher introduced himself and described about the purpose of the study, potential risks and benefits. He reminded that students were free to withdraw at any time of the survey if they did not feel comfortable with any words or sentences or for any other reasons and it will not affect their test marks in anyway. He did not forget to mention that the participation was completely voluntary and

no incentives or compensation will be provided for the participation. He also indicated that he would make all measurements to protect their anonymity. The students were informed not to write their names anywhere in the questionnaire as it was essential that the questionnaires must be anonymous for the reasons of confidentiality. The respondents were assured that this research was purely for academic purposes and there will not be any consequences for them after the research. All the students who wished to participate had signed on the consent form after reading the instructions carefully. All respondents were requested to be sincere and honest in their responses as possible. The respective lecturers who were in charge to administer had taken over and the researcher left the classroom to make himself an outsider. A researcher being an outsider might produce more benefits when compared with an insider [31]. All the students in the Department of Information & Communication technology and Department of Electrical engineering who participated in this study had returned back the filled questionnaire to the administrators. Administrators informed the researcher that all respondents completed before the specified time indicated on the questionnaire. Therefore, the response rate was 100%.

3.9. Data Analysis

Thematic analysis was used to analyse qualitative data. Responses from open-ended were sorted and grouped together based on similar themes. Major themes and sub themes were developed based on the frequency of responses for each open-ended question.

4. Results

As one student skipped open-ended question one, the researcher collected responses only from 154 students. Themes were generated based on the responses of open-ended question one about the benefits of using tablets in classroom. The first major theme based on the frequency of responses was that tablets were beneficial in the classroom for the purpose of learning. It was observed that 52.6% of the participants agreed that they were using tablets to take notes, read ebooks and soft copies, Wiseup and blackboard, e-Learning, record lecture and for assignments. Secondly, 46.1% of the participants agreed that tablets were beneficial for research activities that included gathering information, data researching and getting information through internet. Subsequently, 38.3% of the students felt tablets as a user-friendly tool. It was easy for them to use, access the internet, deliver presentations, easy to carry, download and access old question papers. Furthermore, 16.8% of the respondents engaged and collaborated with their classmates and lecturers for learning. Moreover, they participated in group discussions as well.

As 10 students did not answer open-ended question two, the researcher collected responses only from 145 students. Themes were generated based on the responses of open-ended question two about the drawbacks of using tablets in classroom. Students mainly believed that using of tablets represented a potential distraction to them which was the first major theme recorded. Around 26.9% of the participants reported that they were involved in activities such as browsing social networks sites, attending phone calls etc. About 26.9% of them believed that tablets caused them to loose concentration, focus and attention. Habit of taking photos during the class hours was another drawback, which was reported by 12.4% of participants. While 13.7% of them agreed that they were watching videos while the lecturer was delivering the class, 9.6% of them reported that lack of sim card facility was a drawback of tablets. Furthermore, 5.5% of the participants reported that they had problems while connecting to internet to search for useful information using tablet.

As 14 students did not answer open-ended question three, the researcher collected responses only from 141 students. Themes were generated based on the responses of open-ended question three about the effectiveness of using tablet in classroom. Around 33.3% of the students indicated that the

use of tablets in classroom was effective as they were able to use the device for various purposes of learning such as to take notes, do research and take photos. Around 10.6% of students averred that it was effective as it aided them to engage and collaborate with their classmates. About 8.5% of the students stated that it was easier for them to access the materials for the academic activities. While 7% of the students posited that they were using the tablets for downloading the information from internet, 6.4% of the students stated that it was effective as it helped them to make presentations.

As 13 students skipped the open-ended question four, the researcher collected the responses only from 142 students. Themes were generated based on the responses of open-ended question four about the ineffectiveness of using tablet in classroom. Around 18.3% of the students reported that the use of tablets was causing disturbance in their studies. Secondly, playing games during class hours made 13.3% of the participants to believe that tablet is an ineffective tool. Furthermore, 5.6% of the participants stated that students had problems with internet connection.

Themes were generated based on the responses of open-ended question five about the suggestions to improve the use of tablets in classroom. Around 27% of the students suggested that tablets received by them still needs to have important educational software applications installed prior to delivering tablets to them. About 12.9% of the students suggested to improve the internet connection. It is significant to note that 5.8% of the students had mixed response to have tablets with and without sim card slot. Another 5.8% of the students suggested to block unnecessary apps and websites to restrict the use of social networking during lecture hours.

5. Discussion

The open-ended survey responses revealed that tablets were beneficial in the classroom for learning and research. Agir [32] found similar results in use of tablets that have lead students to better learning and research. Consequently, findings of the current study are consistent with the findings by Agir [32]. Students felt tablet as a user-friendly tool. Many studies [5, 33, 34, 35] revealed the user-friendliness of tablets as a benefit. Therefore, findings of the present study are similar with the findings by Rossing et al. [5], George et al. [33], Alyahya and Gall [34] and Shen [35]. Findings of Mango [24] stressed that students had a high level of engagement and collaboration with each other, which is in line with the finding of present study.

It can be seen that students using tablets in the classroom for browsing social networks sites, attending phone calls were causing distraction to other students. A research conducted by Shen [35] found that only 25% of the participants believed that usage of tablet made distraction, which is not stable with the findings of present study. A study conducted by Alyahya and Gall [34] reported that the participants used their tablets for taking photos and watching videos, which upholds with the findings of the current study.

The current study showed that the use of tablet in classroom was effective as they were able to use the device for various purposes of learning such as to take notes, do research and take photos. Almost all of the participants in the research conducted by Alyahya and Gall [34] posited that they were able to download and prepare for presentations and do multitasking activities using the tablet which harmonize with the findings of the current study. The results of the current study also showed that it aided students to engage and collaborate with their classmates. Rossing et al.'s, [5] study showed that engagement and collaborative learning were high while using tablet which is similar to the results of the present study. Shen [35] averred that it was easier to access the internet on tablet. Easy accessibility of internet using tablet was one of the reasons of effectiveness that was found out in the present study, which concur with the findings of Shen [35].

It emerged from the study that use of tablet was causing disturbance to other students while they were studying or listening to the lectures. Participants in the study conducted by McBeth et al. [36]

agreed that tablets had caused interruptions. Therefore, the results by McBeth et al. [36] are similar to the findings of the present study. Semerci [37] indicated that one of the issues raised from the use of tablets for learning was the slow internet connection. The present study showed that one of the reasons for the tablets to be ineffective was due to the poor internet connection, which is comparable with the results by Semerci [37].

Students in the current study provided various suggestions such as to enhance learning, improve internet connection and block unnecessary apps and websites to restrict the use of social networking during lecture hours. Conn [38] averred that rules and policies must be set in order to develop a sense of awareness for the effective usage of tablets in classroom, which is related to the suggestions of the present study. Inadequate Wi-Fi facilities was a serious issue for students, which was a hindrance to students' engagement and collaboration [39, 40], which is consistent with the findings of the current study.

6. Conclusion

Based on the findings of this study, it could be concluded that while students had benefits in the case of learning, doing research and user-friendliness, they also had drawbacks such as distractions, taking photos and watching videos. Tablets were effective as it was a vital tool for students to learn, engage and collaborate. However, students also believed that tablets were ineffective as students played games, created interruptions in the classroom and had connectivity problems during the study time. It is important to note that despite students suggested to block non-educational apps on tablets, they also suggested to install educational apps and improve the speed of Wi-Fi network in the classroom to enhance the learning. Overall, it should be understood that every technological device has benefits and drawbacks, so in tablets as well. Therefore, if the students can behave maturely and avoid the off-task behaviours, tablet can be considered as a very effective tool for the learning purpose.

6.1. Limitations

Students selected for the sample were only from Information & Communications Technology and Electrical Engineering cohorts. It would have been better if students from other cohorts were also surveyed in this research to seek their views about the benefits and drawbacks of using tablets in the classroom.

6.2. Recommendations

This research recommends to the management of the institutions that are using tablet for learning or have plan to integrate tablets, to install Closed-Circuit Television cameras in all the classrooms to ensure that students are using tablets only for learning. Furthermore, it would be beneficial to install educational apps prior to the delivery of tablets to students and set Wi-Fi network in the campus premises that has high strength.

6.3. Implications for Further Research

From the findings of this study, a comparative study between students in two different universities on the benefits and drawbacks of using tablets in the classroom would be a beneficial study to be examined.

References

[1] Keating, A. (2013). Educating tomorrow's citizens: what role can schools play? Keynote Lecture at the Annual School Leadership Conference for Head teachers in Slovenia, Organised by the Ministry of Education and National School for Leadership in Education. Slovenia.

[2] Kyzym O. H. and Petukhova I. I. (2017). Modern trends in teaching analytical chemistry. International scientific and practical conference of young scientists and student, 20 April 2017.

[3] Husseini, S. M. and Safa, L. (2009). Factors Affecting the Use of Information and Communication Technologies (ICTs) by Iranian Agricultural Faculty Members. World Applied Sciences Journal, 6(8), 1123-1127.

[4] Stahl, G., Koschmann, T. and Suthers, D. (2006). Computer-supported collaborative learning: an historical perspective. In: R.K. Sawyer, Ed. Cambridge Handbook of the Learning Sciences, Cambridge University Press, Cambridge, 409–426.

[5] Rossing, J. P. (2012). Mobile technology and liberal education. Liberal Education, 98(1),.68-71.

[6] Cobcroft, R. S., Towers, S.J., Smith, J.E. and Bruns, A. (2006). Mobile learning in review: Opportunities and challenges for learners, teachers, and institution. Online Learning and Teaching (OLT) Conference 2006. Queensland University of Technology, Brisbane.

[7] Kim, D. K.., Jeong, D., Lu, L., Debnath, D. and Ming, H. (2015). Opinions on computing education in Korean K-12 system: Higher education perspective. Computer science education, 25(4), 371-389.

[8] Popović, O., Marković, D. S. and Popović, R. (2016). mTester—Mobile learning system. Computer Applications in Engineering Education, 24(3), 412-420.

[9] Henríquez-Ritchie, P. and Organista-Sandoval, J. (2012). Propuesta metodol_ogica para la caracterizaci_on de actividades de m-learning realizadas por estudiantes de una universidad p ́ublica. Revista Iberoamericana para la Investigaci_on y el Desarrollo Educativo. http:// www. ride.org.mx/ 1-11 /index.php/ RIDESECUNDARIO/ article/ download/39/39.

[10] Lin, Y. T., and Lin, Y. C. (2016). Effects of mental process integrated nursing training using mobile device on students' cognitive load, learning attitudes, acceptance, and achievements. Computers in Human Behaviour, 55, 1213-1221.

[11] Motiwalla, L. F. (2007). Mobile learning: A framework and evaluation. Computers & Education, 49(3), 581-596.

[12] Rideout, V. (2011). Zero to eight: Children's media use in America. San Francisco, CA: Common Sense Media.

[13] John, S., Poh, A. C. C., Lim, T. C. C., Chan, E. H. Y. and Chong L. R. (2012). The iPad tablet computer for mobile on-call radiology diagnosis? Auditing discrepancy in CT and MRI reporting. Journal of digital imaging, 25, 628–634.

[14] Gordon, A., Jackson, J. and Usher, J. (2014). Learning across contexts-mobile for fieldwork in environmental sciences. Mobile learning: How mobile technologies can enhance the learning experience.

[15] Mang C. F. and Wardley L. J. (2012). Effective Adoption of Tablets in Post-Secondary Education: Recommendations Based on a Trial of tablets in University Classes. Journal of Information Technology Education, 11, 301-317.

[16] Alsufi, D. (2014). Evolution of classroom technology, the new way of teaching, using tablets in schools. Master of Education. Bowling Green State University.

[17] Sheppard, D. (2011). Reading with tablets – the difference makes a difference. http://www.educationtoday.com.au/ article/ Reading-with-tablets--344

[18] Ludwig, L., and Mayrberger, K. (2012). Next generation learning? Learning with tablets as an example for the implementation digital media in schools. Proceedings of the World Conference on Educational Multimedia, Hypermedia and Telecommunications. Denver, CO, 2179-2187.

[19] Kinash, S., Brand, J. and Mathew, T. (2012). Challenging mobile learning discourse through research: Student perceptions of Blackboard Mobile Learn and tablets. Australasian Journal of Educational Technology, 28(4), 639-655.

[20] Niemeijer, D., Donnellan, A. and Robledo, J. (2012). Taking the pulse of augmentative and alternative communication on iOS. http://www.assistiveware.com/taking-pulse-augmentative-and-alternative-communication-ios

[21] Fischman, J. and Keller, J. (2011). College Tech Goes Mobile. Chronicle of Higher Education. http://www.chronicle.com/article/College-Tech-Goes-Mobile/128614/>

[22] Wakefield J., Frawley J.K., Tyler J. and Dyson L.E. (2018). The impact of an iPad supported annotation and sharing technology on university students' learning, Computers & Education.

[23] Chou, C.C., Block, L. and Jesness, R. (2012). A case study of mobile learning pilot project in K-12 schools. Journal of Educational Technology Development and Exchange, 5(2), 11-26.

[24] Mango, O, (2015). iPad Use and Student Engagement in the Classroom. Turkish Online Journal of Educational Technology, 14(1), 53-57.

[25] Cant, M. C., Wiid, J. A., and Enock, P. (2021). Students' perceptions regarding the tablet personal computer (pc) as a mobile learning device at a graduate institute in Tshwane: an exploratory study. Indonesian Journal of Educational Management, 3 (2), 84-96.

[26] Ali, B. (2021). Investigation of iPad tasks and activities carried out by the teachers and students of the foundation program of the Men's & Women's Colleges in Fujairah, United Arab Emirates. Eastern Journal of Languages, Linguistics and Literatures, 2(1), 1–24.

[27] Rumreich, L. E. (2019). First-Year Engineering Student Perceptions and Use of iPad Technologies: A Quantitative Investigation of Mobile Learning. Undergraduate Research Thesis, Ohio State University, Columbus.

[28] Essel, H. B., Nunoo, F. K. N., Tachie-Menson, A. and Amankwa, J. O. (2018). Higher education students' ownership and usage of smart phones and tablets: the case of Kwame Nkrumah University of Science and Technology (KNUST). International Journal of Educational Technology, 5(1), 20-28.

[29] Barfi, K. A. (2020). Information Needs and Seeking Behaviour of Doctoral Students Using Smartphones and Tablets for Learning: A Case of The University Of Cape Coast, Ghana. Ph.D. Dissertation, University of South Africa, Umtata.

[30] Green, D., Naidoo, E., Olminkhof, C. and Dyson, L.E. (2016). Tablets@university: The ownership and use of tablet devices by students. Australasian Journal of Educational Technology, 32(3), 50-64.

[31] Thapar-Bj̈orket, S. and Henry, M. (2004). Reassessing the research relationship: location, position and power in fieldwork accounts. International Journal of Social Research Methodology, 7 (5), 363–81.

[32] Agir, A. (2015). iPad at School: A Holistic Evaluation of the Opinions of Students, Teachers and Parents Concerning iPad Use. International Journal of Education, 7(3), 175-193.

[33] George, P., Dumenco, L., Dollase, R., Taylor, J. S., Wald, H. S. and Reis, S. P. (2013). Introducing technology into medical education: two pilot studies. Patient Educ Couns, 93(3), 522-524.

[34] Alyahya, S. and Gall, J. E. (2012). tablets in education: A qualitative study of students' attitudes and experiences. Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications. Chesapeake, VA: AACE, 1266-1271.

[35] Shen, Y. W. (2015). An evaluation of the impact of using tablets in teacher education. The Online Journal of New Horizons in Education, 6(4), 18-25.

[36] McBeth, M. K., Turley-Ames, K., Youngs, Y., Ahola-Young, L. and Brumfield, A. (2015). The iPad Pilot Project: A Faculty Driven Effort to Use Mobile Technology in the Reinvention of the Liberal Arts. Journal of Teaching and Learning with Technology, 4(1), 1-21.

[37] Semerci, A. (2018). Students' views on the use of tablet computers in education. World Journal on Educational Technology: Current Issues. 10(2), 104–114.

[38] Conn, C. (2012). Managing and maximizing a class set of tablets. Learning and Leading with Technology, 39(8), 32-33.

[39] James, P. T. J. (2011). Mobile-learning: Thai he student perceptions and potential technological impacts. International Education Studies, 4(2), 182-194.

[40] Backhouse, A., Wilson, I. and Mackley, D. (2014). Enhancing the formative assessment environment through the use of mobile technologies. PRACTICE G, 24.