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Mobile Learning Perception and Attitude of Secondary School Students in the Pacific Islands

Research-in-Progress

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Abstract

A new educational paradigm referred to as mobile learning is gaining popularity in the Pacific region. The use of mobile devices such as smartphones and tablets enables students to learn at their own pace and time. With the rapid growth of this new paradigm and adoption by higher education institutes in the learning and teaching pedagogy, it is important that the students mobile learning perception and attitude is known. Therefore, this case study investigates the current Pacific Island secondary school student's mobile learning perception and attitude. The findings of this study indicate that the students have a positive perception and attitude to mobile learning. In addition to this, a significant number of students have already started to use their mobile devices for learning purpose which indicates that the secondary school students would be able to quickly adapt to mobile learning platform when they enter higher education institutes.

Keywords: Mobile learning, perception, attitude, Pacific, secondary school, mobile devices

Introduction

The concept of mobile learning or m-learning, has a variety of definitions. Mobile learning refers to any learning that takes place when the location of the learner is not fixed, or the process of learning is enhanced by using mobile devices and technologies (O'Malley et al. 2005). Mobile learning is also considered as "the overlap of using e-learning (learning by using information technologies and devices) and mobile computing, which includes mobile applications in the small, wireless, and portable devices such as smartphones and PDAs" (Quinn 2000). Mobile learning is defined as "the ability to learn anywhere at any time without physical connection to cable networks" (Georgiev et al. 2004). M-learning is any e-learning application distributed on-demand through mobile digital device (Caudill 2007).

Mobile technologies are developing rapidly, the shift to mobility is occurring day by day, and the mobile devices are now becoming more portable than ever (Messinger 2011). Therefore mobile learning is considered as the activities of using capable electronic information communication technologies and devices to support students to access meaningful learning materials both inside and outside classrooms (Messinger 2011).

Mobile computing provides many opportunities for student learners. The younger generation have become accustomed to the use of mobile devices such as smartphones and tablets in their daily lives

due to the portable nature, the ability to connect, social interactivity and individuality of mobile devices. The high level of Internet penetration and adoption to mobile teaching and learning has aided in efficient content delivery at higher education institutes (Chen et al. 2008). In terms of architecture, mobile learning supports higher education institutes to deliver educational content at a low cost, hence turning out to be the most promising method of learning in this ICT era (Appana 2008; Kim et al. 2005). Mobile learning offers opportunities for the optimisation of interaction and communication between facilitators and learners, encourages and enhances student participation in the various activities of a course (Tom 2003). Learners absorb information at different speeds and in different ways (Geer 2012). Mobile learning enables students to learn at their own pace, by uniquely catering to their requirements in a personalized way. To sum it up, mobile learning stands on the 3 pillars of learning; just-in-time, just-enough, and just-for-me (Sharma et al. 2015).

The use of mobile devices in education is increasing at a rapid pace at all levels of education in the developing countries (Geer 2012). Mobile broadband subscription per 100 inhabitants in the developing countries is 50% and the growth of mobile-broadband subscription in developing countries from 2012 to 2017 is estimated to be 35% (International Telecommunication Union 2017). The application of mobile learning has improved educational standards, made educational services available in remote areas and created cost efficient and flexible learning solutions (Imtian et al. 2012). The students enrolling in higher education are already well versed with the mobile technology for various aspects of their daily lives (Bachmair and Pachler 2015).

Mobile learning in the Pacific region is an emerging concept and it is leading to many innovative learning strategies which have boosted sustainable and quality learning (Sharma et al. 2015). The use of mobile devices for learning has become possible in the Pacific region due to the improved network infrastructure, connectivity, electrical power and user competency. The Pacific region has shown a tremendous growth in mobile subscription, from 2.3 million in 2009 to 4.1 million in 2014 and it is expected that this number will increase fourfold by 2020 (GSMA 2015). Since the usage and ownership of mobile devices is increasing, it is very important that the educators in this mobile era look at the possibilities of integrating mobile devices to learning (Hussin et al. 2012). However, the successful integration of m-learning in higher education institutes in the near future in the Pacific Islands will heavily depend on the current secondary school students' perception and attitude to mobile learning.

Therefore, this paper aims to investigate the current Pacific Island secondary school student's mobile learning perception and attitude. In addition, this study will also find the types of mobile device students own, the amount of time spent using their mobile device to access the internet and whether students use their mobile device for learning purpose. Given the above aims, two main research questions guide this research:

> RQ1. What is the secondary school student's mobile learning perception in the Pacific Islands?

> RQ2. What is the secondary school student's mobile learning attitude in the Pacific Islands?

Background

In the Pacific Region there are 22 developing island countries and territories as depicted in Figure 1 (SPC 2016). The Pacific Island Countries (PICs) cover a wide geographic area with a large number of small islands and comprises mostly of developing economies. Connectivity at present is delivered through a combination of mobile, satellite, undersea cables and fixed networks, and these technologies will continue to serve as the backbone of communications in the region in the future. However, the geographic and physical constraint of fixed networks and the relative cost of satellite connectivity means mobile has the best opportunity to drive connectivity and internet access throughout the Pacific Islands (GSMA 2015; International Telecommunication Union 2017). Due to this, the use of mobile devices for learning has become a strong possibility in the Pacific region.

Figure 1. The 22 Developing Nations of the Pacific.

Tertiary institutions in the Pacific have also taken advantage of this opportunity to introduce m-learning as a new pedagogy for teaching and learning (Sharma et al. 2015). The University of the South Pacific (USP), which is the leading higher education provider, has also embarked on using m-learning. After the successful Tablet Project in 2013, USP has launched the 2017 Tablet Learning Project where it firstly issued tablets to science students in selected campuses enrolled in cohort based programs such as Science Teachers Accelerated Program (STAP) (Sharma et al. 2017) and eventually to every first year student enrolled in a degree program (USP 2017). The USP m-learning team has also developed a number of learning tools for smartphones and tablets which are being used by students (Sharma et al. 2017). The use of mobile devices and apps is now being introduced in the education landscape of the Pacific Islands.

Therefore, it becomes very important to study the Pacific Island students' mobile learning perception and attitude. Specifically, it is imperative to carry out an empirical study of the secondary school students in the Pacific and establish whether current students will be ready to use ICT such as mobile devices for learning when they progress to higher education.

The secondary schools in the Pacific Islands are either owned by government or non-government organizations such religious bodies and school committees. Even though schools are run by non-government organizations, they still operate under the coordination of the Ministry of Education of the respective countries. Similarly, education policies are formulated by the government and all schools observe them regardless of their ownership (Lingam 2012).

Methodology

The study design of this research was ***Descriptive Research*** as this type of research is normally used to better define an opinion or behaviour held by a group of people on a given subject. Thus, Descriptive Research was used to investigate the mobile learning perception and attitude of secondary school students in the Pacific Islands.

Data Collection

For this research, hard copy questionnaires were distributed to senior secondary school students of selected Pacific Island countries. Students from Fiji, Samoa, Tonga and Vanuatu were given questionnaires to fill. The sample was from both rural and urban based schools and were mainly the Year 12 (Form 6) and Year 13 (Form 7) students. Four schools (two rural and two urban) from each country were selected for the sample. Prior to the distribution of questionnaires, approval was sought from the government of the four countries and the heads of the selected schools. After approval was granted by the relevant authorities, the researcher travelled to the four countries to conduct the survey.

For the questionnaire, mixed questionnaire type was used which contained a number of closed ended questions such as Likert scale questions and a number of multiple selection questions. To measure mobile learning readiness and attitude, a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. They were assumed to be valid since they were adapted from the instrument designed in (Hussin et al. 2012) which had passed the validity test. In addition, the Likert scale questions for the two constructs, student's mobile learning perception and student's mobile learning attitude, were tested for internal consistency using the Cronbach's alpha reliability test. The Cronbach's alpha value for perception was 0.813 while attitude was 0.873 which indicated that the questions in each constructs were reliable. A total of 27 (6 demographic and 21 research related) questions were included in the questionnaire. A total of **936** secondary school students responded to the questionnaire.

The data collection took about two months. After data was collected, the data was entered in a spreadsheet file. IBM SPSS software was then used to analyse the data collected. Shapiro-Wilk, Mann-Whitney U and Spearman's rho tests were used for further testing.

Results and Discussion

Demographics

This section considers results from the data collected on participating countries and device ownership.

Figure 2 provides the demographic profile of the survey participants. From the data collected, Tonga has the largest number of participants with 28.6%, followed by Samoa (25.1%), Vanuatu (23.8%) and then Fiji (22.4%). The results also show that there were more female student participants with 53% while male students comprised of 47%. Majority of the students surveyed were from urban based schools comprising of 62.6% of the total participants. For the purpose of the survey, there were only two level of students who were surveyed. The Year 12 students comprised of 69.3% while the Year 13 students comprised of 30.7%.
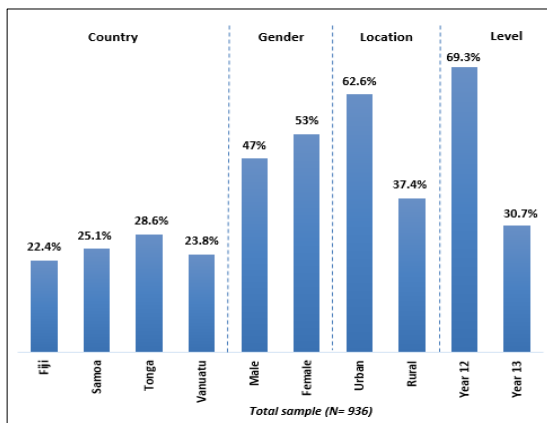

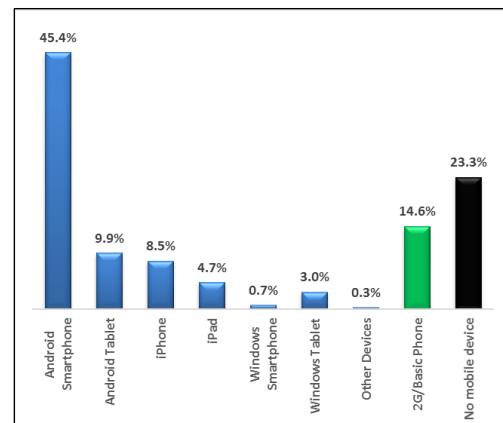**Figure 2. The profile of participants.**

Figure 3. Type of mobile device owned

Figure 3 illustrates that 76.7% of students who participated in this survey owned at least one mobile device while 23.3% of the students did not own any mobile device. This is in line with the recent surveys conducted that the penetration of the usage of mobile devices in the Pacific is increasing including secondary school students. The Android smartphone was the most common mobile device with 45.4% of the secondary school students in the Pacific owning one. Android tablet is owned by 9.9% of students, followed by iPhone (8.5%), iPad (4.7%), Windows tablet (3%), Windows smartphone (0.7%) and other devices (0.3%). 14.6% of students use 2G or Basic phones which lack the advanced functionalities of a smartphone.

Android smartphones are more common due to the fact that these phones are cheaper and affordable compared to iPhones. Also, securing the apps for Androids is easier and cheaper compared to the iPhones since the apps installed in androids are from Google hence the users' easily download and upgrade the apps while for iPhones one needs to download apps from App Store using their Apple ID usernames.

Table 1 shows the time spent by the students accessing the internet on their mobile device on an average day. 17.6% of the students spent *less than 1 hour* accessing the internet on their mobile devices, 17.7%

of students spent *1 to 2 hours*, 14.2% of students spent *2 to 4 hours* while 12.9% of students spent *more than 4 hours*. In contrast, 14.2% of students *do not use internet* on their mobile device while 23.3 % of students *do not have mobile devices*. Overall, a significant majority of students (62.5%) spent some time using the internet on their mobile device while the other 37.5% of students did not use internet at all.

The result indicates that the usage of internet in mobile devices by secondary school students in the Pacific has significantly increased. This is also in line with recent reports that internet access on mobile devices has increased in the Pacific and in education.

Table 1. Time spent accessing the internet on mobile device on an average day

Time spent per day	Frequency	Percentage	Combined Percentage
Less than 1 hour	165	17.6%	
1 to 2 hours	166	17.7%	
2 to 4 hours	133	14.2%	62.5%
More than 4 hours	121	12.9%	
Do not use Internet	133	14.2%	
No Mobile Device	218	23.3%	37.5%
Total	936	100%	100%

Figure 4 shows the different ways the students used their mobile device. 94% of the students who own a mobile device used their devices for *texting* or *calling*. A significant 82.5% of students used their mobile device for *social networking*. Students also used their mobile device for *listening to music* (72.6%), *photography* (72%), *playing mobile games* (64%) and *watching videos* (52.2%). The students also used *email*, *Viber*, *Skype* and received *news alerts* however these were not so common.

A noteworthy 60.5% of students who have mobile devices used their devices to search for information using *Google search engine*. This result shows that apart from the normal uses of mobile devices, students have to some extent also used their mobile device for learning purposes.
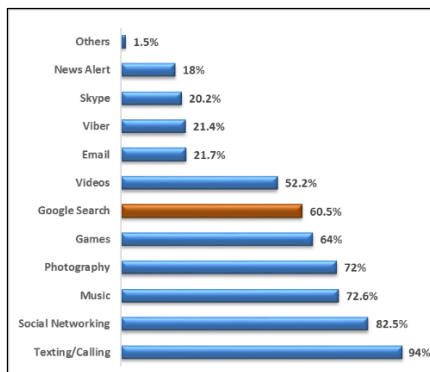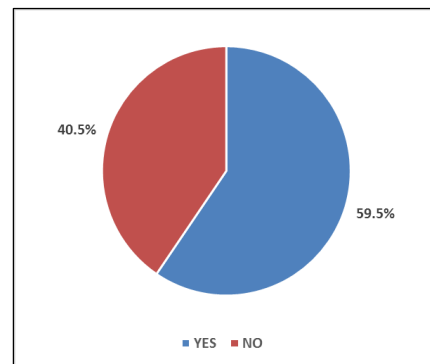

Figure 4. Some uses of mobile device

Figure 5. Mobile device for learning

Figure 5 shows the response of student to using their mobile devices for learning purposes. A notable 59.5% of all the students surveyed responded positively to using their mobile device for learning. This result confirms that secondary school students have started using their mobile devices for academic purposes.

Student Mobile Learning Perception

This section considers results from the data collected on students' perception to the use of mobile devices for learning.

Table 2 displays mean scores and standard deviation of students' mobile learning perception. Item 5 *"Mobile devices provide easy access to learning materials."* has the lowest mean score of M=3.58 while Item 7 *"It is a good idea to use the mobile devices for online learning."* has the highest mean score of M=4.30. This indicates that not all students perceive that mobile devices can provide easy access to learning materials. This could be due to the non-affordability of internet connectivity by the Pacific island

students and non-affordability of smart phones and tablets however most students agree that it is a good idea to use mobile devices for online learning.

All the other items have a high mean score greater than 4. Therefore, majority of the students feel that mobile learning makes learning more convenient, flexible and fun. Students perceive that mobile learning is a new innovation to education. In addition, students agree that mobile devices are user friendly and learning using a mobile device can take place at any time.

Overall, the students have a high mean score for mobile learning perception. From the results, it can be concluded that the secondary school students' perception to mobile learning is positive in the Pacific.

Table 2. Student's m-Learning Perception

No.	Items	Mean	SD
1	Mobile learning makes learning more convenient.	4.08	0.81
2	Mobile learning makes learning more flexible and fun.	4.09	0.66
3	Mobile devices are user friendly.	4.05	0.82
4	Learning can take place 24/7	4.16	0.82
5	Mobile devices provide easy access to learning materials.	3.86	0.57
6	Mobile learning is a new innovation to education.	4.21	0.75
7	It is a good idea to use the mobile devices for online learning.	4.30	0.53

Table 3. Student's m-Learning Attitude

No.	Items	Mean	SD
1	When I hear about new mobile technology, I look for possibilities to use it.	4.12	0.58
2	I am usually the first to try any new mobile technology.	3.58	0.86
3	I like to explore any new mobile technology.	4.11	0.79
4	I think it is very interesting to try new mobile technology for learning.	4.20	0.51
5	I would be able to use a mobile device for learning without any assistance.	4.01	0.81
6	I would be able to use a mobile device for learning if someone assisted me to get started.	4.41	0.60

Student Mobile Learning Attitude

This section considers results from the data collected on students' attitude to the use of mobile devices for learning.

Table 3 displays mean scores and standard deviation of students' mobile learning attitude. Item 2 *"I am usually the first to try any new mobile technology."* has the lowest mean score of M=3.58 while Item 6 *"I would be able to use a mobile device for learning if someone assisted me to get started."* has the highest mean score of M=4.41. This indicates that some students are reluctant to be the first to try any new mobile technology. This could be due to the non-affordability of some new mobile devices such as smartphones and tablets. Lack of knowledge of operating new mobile devices could be another reason for not being the first to try new mobile devices however most students are able to use a mobile device if someone assisted them to get started.

All the other items have a high mean score greater than 4. Therefore, majority of the students look for possibilities to use mobile technology whenever they hear about it, explore new mobile technology and feel that it is interesting to use mobile devices for learning. Most students would be able to use mobile devices for learning without any assistance.

Overall, the students have a high mean score for mobile learning attitude. From the results, it can be concluded that the secondary school students' mobile learning attitude is positive in the Pacific.

To test for the normality of the data, a Shapiro-Wilk test was carried out as shown in **Table 4**. The hypothesis is as follows:

H_0: The data follows normal distribution.

H_1: The data does not follow normal distribution.

Since the p value = 0.00 < 0.05 for both mobile learning perception and mobile learning attitude, we can reject the null hypothesis and say that data collected does not follow normal distribution therefore non-parametric tests are used for further analysis.

Table 4. Test for Normality

	Shapiro-Wilk		
	Statistic	df	Sig.
Perception	.812	936	.000
Attitude	.947	936	.000

Table 5. Test of Gender Comparison

	Perception	Attitude
Mann-Whitney U	101074.000	107324.500
Wilcoxon W	222845.000	229095.500
Z	-2.021	-.460
Asymp. Sig. (2-tailed)	.403	.646

A Mann Whitney U test was carried out to compare the differences between the mean scores of male and female students as shown in **Table 5**. The hypothesis is as follows:

H_0: There is no significance difference in mobile learning perception and mobile learning attitude between males and females.

H_1: There is significance difference in mobile learning perception and mobile learning attitude between males and females.

Since the p-value = 0.403 > 0.05 for mobile learning perception and p-value = 0.646 > 0.05 for mobile learning attitude, we can accept the null hypothesis and say that there is no significance difference in mobile learning perception and mobile learning attitude between males and females. This is due to the fact that both males and females experience the same learning environment and have the same access to technology such as mobile devices.

In addition, the correlation between mobile learning perception and mobile learning attitude was determined using Spearman's correlation test. The hypothesis is as follows:

H_0: There is no statistically significant correlation between mobile learning perception and mobile learning attitude.

H_1: There is statistically significant correlation between mobile learning perception and mobile learning attitude.

The correlation coefficient = 0.308 indicates that there is strong positive correlation between mobile learning perception and mobile learning attitude. Since the p value = 0.00 < 0.05, we can reject the null hypothesis and say that there is statistically significant correlation between mobile learning perception and mobile learning attitude.

It can be implied that this is also true for the population since students with positive mobile learning perception also have positive mobile learning attitude.

Conclusion

This paper presents the findings of senior secondary school students' mobile learning perception and mobile learning attitude in the Pacific region. It is established from the survey that the secondary school students in the Pacific region have both a positive mobile learning perception and a positive mobile learning attitude.

In addition to this, a significant number of students have already begun to use their mobile devices for learning purpose which indicates that the secondary school students would be able to quickly adapt to a mobile learning platform when they enter higher education institutes.

Since it is evident that secondary school students' perception and attitude to mobile learning is positive in the Pacific, educational institutes should now start integrating m-learning in their courses in addition to learning management systems. For future work, an investigation on the perception and attitude of facilitators for using mobile devices for academic purpose can be carried out.

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