

Student Readiness and Perception of Tablet Learning in Higher Education in the Pacific- A Case Study of Fiji and Tuvalu: Tablet Learning at USP

Pritika Reddy, Fiji National University, Suva, Fiji

Bibhya Sharma, The University of the South Pacific, Suva, Fiji

Shaneel Chandra, Central Queensland University, Rockhampton, Australia

ABSTRACT

Significant growth and successful integration of mobile devices to the education landscape have garnered the introduction of mobile learning (mLearning) as a new technology-enabled educational tool. Mobile learning has become a new higher educational paradigm which makes learning more flexible and accessible. However, student readiness and their perceptions about educational use of tablet devices are still a concern particularly in the developing countries like the Pacific island countries (PICs). This article investigates these two important attributes of tablet devices in a first year blended course from a higher education institute in the Pacific with a sample of 43 students. The results revealed that the participants perceived that tablet devices were effective and innovative learning tools. The participants supported the idea of using tablet devices and were ready to incorporate them for learning provided there was training in place. This article finally outlines recommendations for the education sectors in the Pacific.

KEYWORDS

Higher Education, Pacific, Student Perception, Student Readiness, Tablet Learning

INTRODUCTION

The rapid development in information and communications technologies (ICT) has brought about significant changes to various aspects of our lives and everyday endeavors, most recently, education (Chandra & Sharma 2018). The vast usage of emerging technologies and technological devices in education has re-engineered higher education curricular, and transformed its modality from face-to-face to virtual learning and the type of learning from teacher-centered to student-centered (Ajoku, 2014; Al-Fahad, 2007). The student-centered learning enables learners to be more involved in learning through prior knowledge, critical and creative thinking, problem solving, experimentation and discovery, hence the learners work on information to create and share knowledge (Dimitrios et al., 2013; Joutsenvirta & Myyry, 2010; Morrison, 2014; Reddy & Sharma, 2015). It is widely documented in the student-centered learning that the role of a teacher transforms to that of a facilitator of learning, which is from a sage on the stage to a guide on the side (King, 1993; Morrison, 2014). Notwithstanding the transformation, the teacher's role remains essential for learning (Morrison, 2014).

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The integration and assimilation of appropriate ICT technologies into learning and teaching has resulted in strong positives including enhanced student-centered learning (by making the delivery of content robust and engaging), improved quality of the content and flipping of the entire learning process deepening the creation of knowledge (Bachmair & Pachler, 2015; Joutsenvirta & Myrsky, 2010; Makewa et al., 2014; Sharma et al., 2015). However, the integration of ICT to succeed depends largely on the readiness, utilization and perception in embracing the new technology-driven education paradigm (Bernado, 2013). The paper considers these three important attributes for tablet learning in higher education in the Pacific.

The Pacific Islands have shown enormous growth in the use of mobile devices and broadband technology in recent years. A decade ago telecommunication services were provided to and provided by only the government authorities and were costly, however the improvement in ICT infrastructure in the Pacific in the late 2000's increased the access to telecommunication services and the Internet at a reasonable cost ("The state of broadband 2015, Annual Report" 2015). According to the Groupe Speciale Mobile Association (GSMA), mobile broadband connections will grow from 1.1 million in 2014 to 4.1 million in 2020 ("The Mobile Economy Pacific Islands 2015" 2015). Figure 1 illustrates the percentage population of Internet users in the Pacific Island countries. According to the statistics shown in Figure 1, it can be said that the diffusion of Internet in the Pacific is paramount.

A survey by International Telecommunication Union (ITU) carried out in 2015 shows that by the end of the year 2015, the mobile broadband subscription per 100 capita in Fiji was estimated to be 42.3%, the percentage of households with Internet was 29%, and the percentage of individuals using Internet was 41.8% (GSMA Association, 2015). In another Pacific Island Country (PIC) report about Tuvalu, in 2015 about 3000 people were subscribed to broadband and 6000 people had mobile subscription ("The Mobile Economy Pacific Islands 2015," 2015). With the availability of high speed Internet, falling prices and accelerating growth in the use of and subscription to Internet, education institutes in the Pacific are shifting their focus towards ICT leveraged learning in order to provide quality education to the populace - 1 of the 17 Sustainable Development Goals (SDGs) or global standalone goal (Alexander, 2014; United Nations, 2017).

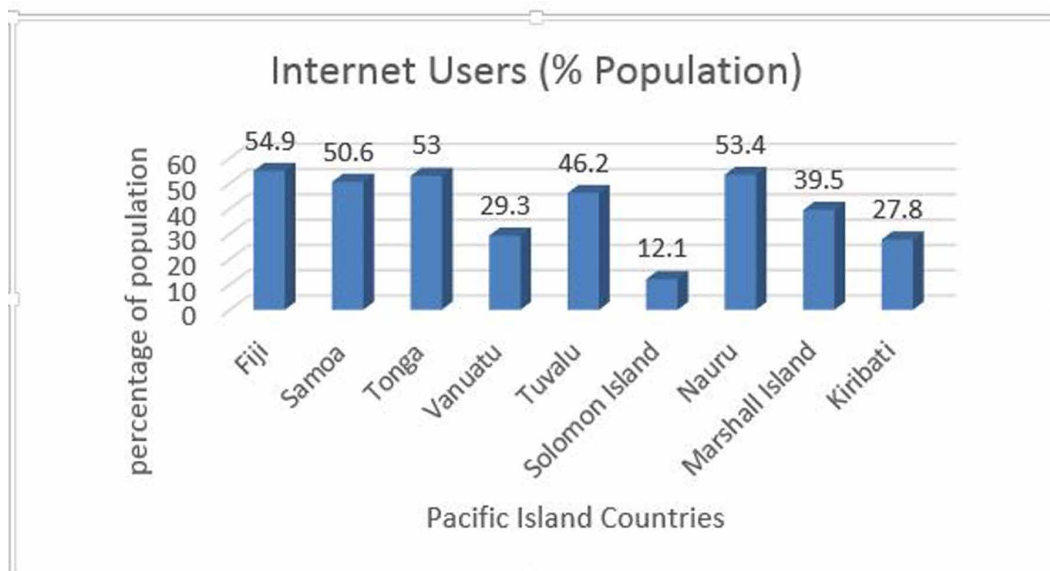
ICT-leveraged learning also provides a window of opportunity to the distance learners who are able to pursue education from the comfort of their homes and workplaces. The mature-age and working students (who are part time and aged between 22- 35) are able to enroll in online programmes and obtain academic qualification without normally having to travel to campus for face-to-face classes. With the new ICT innovations and the increased capability and capacity of higher education institutes to provide flexible and distance learning to their students through the use of wireless technology is now trending in higher education (Sharma et al., 2016). Although following a lag, the trend is permeating fast in the Pacific region (GSMA Association, 2015; ITU, 2015). Mobile learning is now a common trend in the Pacific due to the portability and affordability of devices, reduced costs of Internet and mobile-broadband, and the improved ICT infrastructure (GSMA Association, 2015; ITU, 2015; Sharma et al., 2015). The new learning tool invariably engages students in both active and passive learning environments, provides self-paced and self-directed learning in students' personal space, and boosts the facilitation of distance and flexible learning (Chandra and Sharma 2018; Sharma et al., 2015). Therefore, this paper will reflect on the use of mobile learning device in the Pacific and the student readiness, utilization and perception of using this mobile device for higher education learning.

BACKGROUND

A Case Study at The University of the South Pacific

The University of the South Pacific (USP) is owned by the governments of 12 countries in the Pacific region: Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Samoa (Reddy et al., 2016). Each member country houses a campus for the

Figure 1. Percentage population using Internet (Miniwatts Marketing Group, 2018)

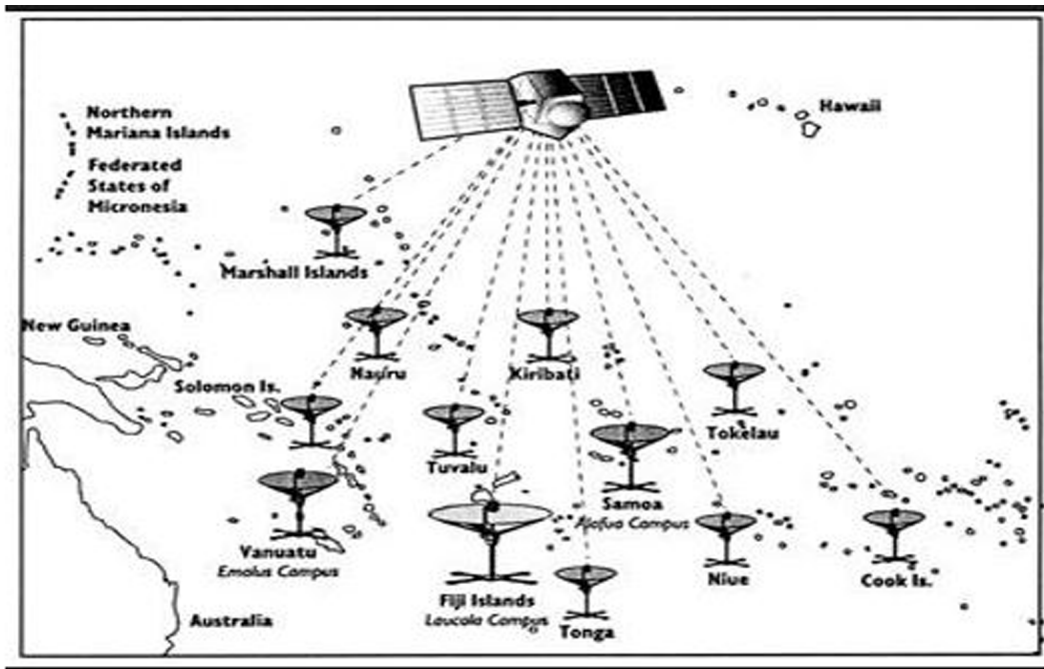


students while Fiji has the main campus located in Suva in addition to two others in the northern and western urban centers. Additionally, there are 10 centers in the region which have been set up to provide assistance to the remotely based students enrolled at the university. Considering the vast geographical spread of the regional countries covering around 33 million km² as shown in Figure 2, the university face a lot of challenges to connect all its campuses and centers and provide quality education to all its member countries (Sharma et al., 2015). The USP has its own telecommunication system known as USPNet, which uses satellite and links all the regional campuses through the C-Band satellite portal as illustrated in Figure 2 (Sharma et al., 2015).

In 2017, USP's student enrolment stood at 25,242 ("Enrolments," 2017) due to the availability and penetration of new ICT tools and mobile devices. The university now has been making education available to all its learners, irrespective of time, place, and age and socio-economic background (Sharma & Reddy, 2015). The adoption of new tools and technologies is improving the quality of its distance education as the university is able to successfully deliver its programs in blended (30-79% of delivery is online) and online modes (80%+ is delivered online) as well (Sharma et al., 2015). The university introduced mobile learning through the SMS notification service in 2011 (Sharma et al., 2011), and in subsequent years, has embarked on the integration of the service into learning to provide a higher level of support to the learners (exam information and access to student marksheet) and to engage them psychologically by motivating and reminding them to keep pace with course schedules and requirements, as well as to help them develop self-regulation skills (Sharma et al., 2019). In addition, USP is adapting to the demands of its 21st century learners (accessibility to learning resources from anywhere and at any time and self-paced learning) by integrating ICT into learning processes and hence helping the students to be work-ready.

The use of tablet devices has made a place of its own in the education sector due to the fact that the tablet devices increases flexibility of learning, promotes self-directed learning and enhances students' creative skills (Reddy, Sharma, & Hussein, 2017). In 2013, USP distributed 600 tablet computers to distance students from selected regional campuses to make learning easier and more accessible. This tablet project has been extended in 2017 with free distribution of almost 3,000 tablets to the new first year degree students as well as students enrolled in selected cohort-taught programs

Figure 2. USP campuses and centres connected through satellite (Adopted from google.com)



in its regional campuses. A driving motivation for this initiative is to support USP students so that they do not necessarily have to rely on computer labs to get access to course and learning materials, have the ability to use the connections at home, carry their learning materials with them, and have exposure to the future of new learning pedagogies (News @ USP, 2017). In the recent past, USP has also implemented a number of mobile services such as SMS notification system, edutainment (learning through a medium that both educates and entertains for example the “GO Nuts Game”), course finder app (an app that has been developed to enable students to find their respective courses for a particular semester) and mobile course modules which add to its growing repository of ICT driven student learning support (Sharma et al., 2015; Reddy& Sharma, 2015).

Despite the wide proliferation and the implementation of mobile learning services in higher education in the Pacific region (Raturi, 2010), students’ readiness, utilisation and perception of using the mobile devices for learning remains a major concern. Most of the Pacific students are not prepared to use the mobile devices for learning (Raturi, 2010; Reddy & Sharma, 2015) as the popularity of these devices is still concentrated to social networking, communication and gaming.

Accordingly, this research survey will evaluate the readiness, utilization and perception of incoming students to the university towards tablet learning in the Pacific – concentrating on Fiji and Tuvalu due to the fact that the devices were only enough for these two cohorts when the survey was conducted.

LITERATURE REVIEW

ICT and Distance Education

Recent developments in interactive multimedia technologies have, to a great extent nullified the differences between distance and traditional education (Bernado, 2013). The integration of interactive media such as audio and video conferencing, satellite communication and multimedia computer

technology has promoted effective student-facilitator interactions, enabled learner access to vast online resources, extended and transformed learning styles, enhanced student-centered and collaborative learning, transformed teaching and learning processes and envisioned a new ICT-enabled learning paradigm (Dimitriou, 2013).

The most promising concept of technology-integrated distance education is ELearning, which by definition is the appropriate use of ICT tools to enhance learning on campus(face-to-face) or off campus in other contexts such as blended or online or cohort – taught learning (Bernado, 2013; Pop, 2016). According to Shopova (2012), ELearning has opened up new opportunities to raise standards, widened participation in lifelong learning and improved learning experiences (Sharma et al., 2018). It has also enabled the facilitators to transform the ways they teach, use interactive computers to enhance knowledge building of students, reinforce learning with the use of videos, audios, quizzes, discussion forums and digital walls, model real-world systems and scenarios, improve retention, and customize learning materials for differentiated and personalized learning (Park, 2011; Sharma et al., 2015; Reddy et al., 2016). Most recently, the education landscape has also witnessed the emergence of handheld devices that offered new online opportunities in distance learning, unimaginable a few years ago.

The combination of ELearning and Internet-enabled mobile devices spawn a new technological platform entirely, known as mobile learning, which is now a tool for students to get access to learning resources irrespective of location and time, and connects to classmates and facilitators (Haag, 2011; Hussein & Cronje, 2010). Reddy et al. (2017) further adds that mobile learning stands on three important pillars of learning: “just in time”, “just enough” and “just for me.” Park (2011) states that mobile learning is not just the use of mobile devices but the way it is utilized in different contexts. According to (Prieto et al., 2013) mobile learning is a ubiquitous learning activity occurring through person-to-person communication using a mobile device which is supported by an appropriate mobile technology, user interface and a pedagogical approach. The concept of mLearning is also trending in higher education today because of the following attributes (Reddy & Sharma, 2015; Gong & Wallace, 2012; Mahamad et al., 2010):

1. Mobile devices are attractive, durable, inexpensive and more convenient for incorporating into learning and teaching pedagogies;
2. Better management and utilization of resources- for facilitators it becomes easy to organize the course, distribute additional resources to students;
3. Enables mobigogy – learning is controlled and facilitated by the teacher; however, students have the freedom to learn at any time and from any location;
4. Improves and enhances collaborative discussions between peers and facilitators; and
5. Delivers learning to student personal learning space.

Higher education providers have started to adopt the mLearning tool to provide students and facilitators with powerful support for effective learning and to boost learners’ motivation for lifelong learning (Rosman, 2008). According to Emran et al. (2013), the development of mobile computing devices and Internet has changed the higher education environments, meaning students are now implementing the use of mobile devices in their classrooms. Henceforth, the mobile technology has become an important part of the educational process. Mobile technology leveraged education has brought many benefits to the students and the academics as well such as providing learning anywhere and anytime, enabling students to broaden their technological awareness, knowledge sharing, providing assistance to students with disabilities to continue with their education and enabled higher education institutes to extend their conventional educational platforms (Reddy et al., 2016; Emran et al., 2013; Dimitriou, 2013).

The selected mLearning projects include the use of:

1. Podcast by universities in UK, Europe, USA, Canada and Australian universities to deliver educational content through mobile devices (Duncan & Lee, 2007).
2. Mobile devices in Australia to deliver learning to workplaces, self- induction offsite and to deliver creative learning initiatives (Duncan & Lee, 2007).
3. SMS to deliver English language lessons in Japan and microeconomics experiment in Sydney (Duncan & Lee, 2007).
4. SMS for quiz assessment, access to student marksheet and exam information at the University of the South Pacific (Reddy & Sharma, 2015).

Despite the usage of mobile devices as a potentially powerful learning tool, mLearning has faced the following challenges (Park, 2011; Rosman, 2008):

1. Device limitations such as interface, screen size and functionalities.
2. Instructional training – proper training and usage on the device need to be provided to facilitators and students.
3. Technical training for maintenance and upgrade of the devices.
4. Security and maintenance of the devices can be costly.
5. Pedagogical issues such as learners cognitive abilities, prior knowledge, emotions and motivation.
6. Rapid change in versions with changes to functionalities and applications.

Despite the apparent benefits and challenges noted above, mobile learning can be intimidating as technological knowledge is required by the users. However, with the right methodology of introducing the mobile devices such as tablets and smartphones to learning can help reduce digital gap that exists between users who have basic level of technological knowledge and advanced level of technological knowledge (Prieto et al., 2013).

Tablet Learning

The education landscape has undergone a huge transformation with the incoming of the mobile devices. One of the mobile devices which has gained its popularity in the use of it for learning today is the Tablet PC. Tablet PCs have been around for decades and the fact that the device similarities with smart phones and laptops has attracted the attention of students and has helped them develop their visual memory and motivation, strengthen their personal autonomy and creativity (Bachmair & Pachler, 2015; Bernado, 2013). For the learners, the Tablet PCs have enabled better peer to peer collaboration, matched their preferred learning style, academic performances and has shown a positive relationship between the use of educational technology and student engagement (Bernado, 2013; Edgar, 2012; Rossing et al., 2012). Recognizing that tablets have facilitated enhanced learning and delivery of course content, many countries have freely distributed tablets to their students and teachers, for example:

1. Malaysia 2016. The primary and secondary school teachers are given a tablet each in order to bring technology in the classrooms. About 430,000 tablets were distributed (Rasheed 2016).
2. Jamaica 2016. Teachers and students in primary and secondary schools in Jamaica are given a tablet each in a 1-year pilot project (Angus 2016).
3. Pacific 2017. University of the South Pacific has freely distributed tablets to its first year students at various campuses throughout the Pacific region (News @ USP, 2017).

All the levels of education (From primary to tertiary) have willingly embraced education reform to improve the availability, quality and equity of basic education (Edgar 2012). Today, tablet devices are seen to be the most trending devices that are being utilised for learning amongst the new generation

of students. They appeal to the younger generation (Koh & Hill, 2009) due to that fact that the device provides an opportunity for students to experience a more collaborative and engaging discussion with their peers and facilitators, connect to online learning resources such as online chats, web – based quizzes, discussion forums and online tutorials (Sharma & Reddy, 2015). To facilitate online courses, the use of ebooks, interactive media, broadcast style lectures, YouTube videos, blogs and wikis are used by higher education providers, and the Tablet PCs are seen to be the most effective and efficient mediums for these e-resources to be successfully delivered to students (Majumdar, 2006). Alsulami (2016) and Kisber (2013) state that the e-resources can easily be assimilated in the Tablet PCs to integrate and consolidate the learning processes, enhance learning experiences, increase flexible access to resources and empower students to increased contribution and reusing of learning objects and content generation tools. Since, the significant use of tablet devices have shown positive contribution towards online learning, many educators are utilizing this technological device as a new learning tool (Angus, 2016). Tablet learning has created new opportunities in the teaching, learning and delivery processes; however, effective usage and the success of the device as a learning tool is hugely dependent on student readiness, acceptance and perception which need to be explored before the new tool is deeply rooted into the mainstream of teaching and learning.

Tablet Learning and its Acceptance

The perceived ease of use and perceived usefulness are two important characteristics that are identified by researchers for any technology to be accepted by users. According to literature various theoretical models such as TAM and UTAUT have been developed to explore the acceptance of mobile learning devices. According to (Tarhini et al., 2013; Masrom, 2009), the TAM model has been designed to predict the user acceptance of computer technology. He also posits that the attitude of a user towards technology is based on its ease of use (how effortless using the technology will be) and its usefulness (degree to which the user believes that using the technology will improve his or her work performance). According to Emran et al., 2013, the TAM model was designed to assist users decide whether to accept or reject a particular technology based on the effects of variables on the attitudes. The variable attitude provides an understanding of how the user perceives and accepts a technology.

The UTAUT (Unified Theory of Acceptance and Use of Technology) was developed by Venkatesh et al. (2003) by combing other theoretical models such as Technology Acceptance Model (TAM), Innovation Diffusion Theory (IDT), Theory of Reasoned Action (TRA), Motivation Model (MM), Theory of Planned Behavior (TPB), Combined TAM and TPB, Model of PC Utilization (MPCU), and Social Cognitive Theory (SCT) examine the users intention to adopt and use mobile learning (Hujran et al., 2014; Mtebe & Raisamo, 2014). The variables: gender, age, experience, and voluntariness of use moderate the key relationships in this model. According to (Khechine et al., 2014) UTAUT model is the best model to gauge user intention and perception of using technology and provided a proper guidance for future research.

This study uses variables of the TAM and UTAUT model and explores student readiness and perception towards using Tablets for learning in the two Pacific countries. For tablet learning to be successful in the learning process at higher education, it is important to investigate student readiness, utilization and perception. In the Pacific as mentioned above in the Introduction section, the use of Internet and the mobile devices has been exploited. The major higher education provider in the Pacific region, the USP has also adapted mobile learning into its teaching and learning pedagogy, however, it has been observed that there is minimum or no research done to evaluate the readiness, attitude and perception of students using these new devices for learning. In order to draw a better picture if this new method of learning has been accepted by the students or not, this study has been conducted.

RESEARCH PROBLEM

According to the surveys conducted in the Pacific, the usage of mobile devices such as tablets has escalated in the education landscape. Due to its flexibility and engaging nature learners have become attracted to this new device for learning. Also, The University of The South Pacific which is a major higher education provider in the Pacific has incorporated and distributed tablets to be used for learning to its selected regional campuses. This was to support student learning and make resources accessible to the students enrolled across the region. However, there is still no underlying data if the students are ready to use Tablets for their learning at higher education particularly in the Pacific. Therefore, this study intends to investigate student readiness, utilization and their perception on tablet learning from 2 countries in the Pacific.

METHODOLOGY

This quasi-experimental research was conducted using a survey to determine student readiness, attitude and perception of tablet learning devices for learning. A semi- structured interview was also carried out to provide an insight to the problems and the challenges the participants faced in regard to tablets as learning devices. From the 105 incoming first year students enrolled in a blended course: UU100 – Communication and Information Literacy at USP, a sample of 43 participants (18 male and 25 female volunteers) were tracked for 5 weeks. This 5-week course was used to determine the readiness, perception of the students and the utilization of tablet devices in higher education. The sampling techniques used was convenience sampling method whereby the two students of the two countries chosen were easy to reach and monitor. The sample size was 43 since that was the number of devices available at that point in time at the university when the research was carried out as the use of Tablets for learning was just beginning in the Pacific.

The students were informed about the survey using different mediums such as lecture announcements, online forums and emails. Together with this, this research also considered the actual utilisation of tablets in other words what did the students used the tablets for. The volunteering students were provided with the tablet devices which were returned upon completion of the course. These devices were preloaded with course materials such as notes for each topic, supplementary videos on important concepts and help videos on assessments. For the study, only 3 out of 14 USP campuses (Labasa Campus= A, Lautoka Campus = B, and Tuvalu Campus = C) were selected, because of the limited of the tablet devices, and 3 other campuses were included as the control group Marshall Island Campus= D, Kiribati Campus = E, Nauru Campus = F. Table 1 shows the distribution of the devices and the number of participants from each campus. The control group also had 43 students so that the performance of the students could be compared with the experimental group which had 43 students. The experimental group had 43 students as the student number and the number of devices available at the time when the survey was conducted was 43.

For the purpose of this study, two sets of open-ended questionnaires (pre/post) were distributed to the control and experimental groups that totaled 86 students. Once the questionnaires were collected, a qualitative analysis was carried out using the SPSS and MS Excel software. To test for the validity of the questionnaires, a pre- test was run whereby the questionnaires were given to a group of first year students. Since, the students had no issues in answering the questions, it was assumed that the questions in the questionnaire were clear and the questionnaire was user- friendly.

Figure 3 illustrates the research design for this study. The 3 variables considered in this study were student readiness, student perception and the use of tablet device for learning. The pre-course and post course questionnaires were used to collect data on student perception, experience, satisfaction and device utilization. For student readiness, the study considered the ownership of and competency in using the devices. The perception of tablet devices was based on the students' responses given on

Table 1. Summarised data for the number of students and devices used at the selected USP campuses

Description	Experimental Group	Control Group
A Case Study of a blended course – UU100.	Campus A- 14 students, B- 17 students (who were given Androids) and C- 12 students (who were given iPads) Total = 43 students	Campus D- 14 students, E- 16 students and F- 13 students (using device of their own choice such as desktops, laptops and notebooks) Total = 43 students

their experiences with flexibility in learning, connection to Internet and usability of the devices. The survey also considered student satisfaction of using the tablets for learning and the issues they had faced while using the devices for learning.

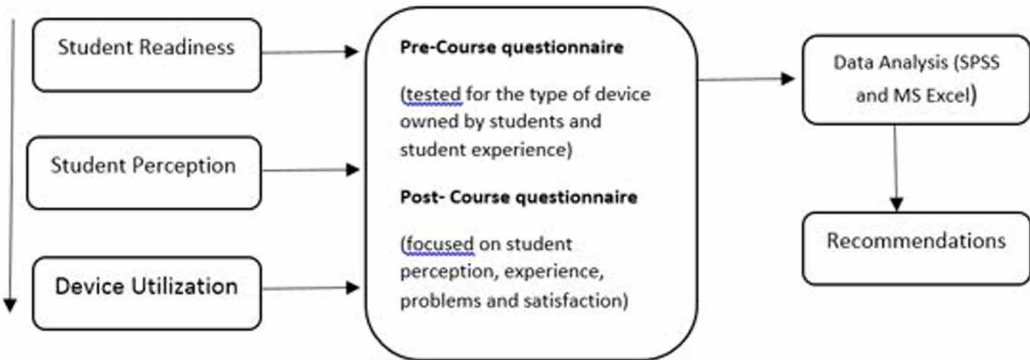
RESEARCH SETTING

In Fiji, the ICT market revolves around three major companies ATH – Amalgamated Telecommunication Holdings Limited (shareholders are Vodafone Fiji, FINTEL and Telecom Fiji), Digicel Group Ltd and Communications Fiji (Unwired Fiji). Telecom Fiji started commercial Internet service in 1995, later in 2008 Vodafone Fiji developed a 3G network and by 2014, mobile broadband was supported by Vodafone’s 3G, 4G network and Digicel’s 3G network, respectively. As of 2018, there were about 54.9% of the population in Fiji are Internet subscribers (Miniwatts Marketing Group, 2018). In Tuvalu, Tuvalu Telecommunications Corporation (TTC) is the sole owner of telecommunications and is the only Internet service provider with around 46.2% of the population are Internet subscribers.

Established in 1968, USP is a higher education provider in the South Pacific. The university has a wide range of academic programs at the undergraduate and postgraduate levels in a variety of modes and technologies with the commitment to meet the academic requirements of the students enrolled in the region (Sharma & Reddy, 2015). It has adopted and integrated ICT in its learning and teaching processes in order to provide premium high-quality education equivalently across the Pacific region. The USP has a pivotal role in the ICT development in the Pacific.

Prior to this study, the first year USP students used the computer labs at their local campuses and/or used their own laptops and tablets or notebooks to access electronic course resources or participate

Figure 3. Research design for the quasi- experimental survey. This model was derived from TAM model



in online activities. The collaboration amongst the students and facilitators was generally face-to-face when there was a need, while research was done individually with little or no interaction. Upon setting up of the study, the participants were each provided with a tablet and the impact surveyed. Different survey techniques were used to test the readiness, perception and utilization of the tablet devices for learning. The survey also, looked at the device ownership and experience of the students using the devices.

RESULTS

Device Ownership

From Figure 4, 53.5% of participants owned a laptop, 25.6% of the students owned desktop computers, Android tablets or iPads, whilst 20.9% of the students did not own any mobile device. A greater percentage of students from Tuvalu owned portable devices when compared to the participants from Fiji enrolled in this particular survey. Since the ratio of working population of Tuvalu and Fiji was approximately 3:1 of the total sample, the participants had more mobile devices such as laptops, tablets and iPads. From informal interview sessions, it appeared that the socio-economic background of the students, economic development in terms of electricity, ICT penetration and the employment rates were contributing factors that led to the purchase and ownership of the different computing devices.

The survey also examined the usage for mobile devices among students. According to the responses summarized in Figure 5, 58.2% of the students had experience in using mobile devices and in the 2 Pacific countries the use of tablets was mainly for social purposes (Internet surfing, Facebook). We note that only 4.7% of the participants reported using their devices to access the course resources (these participants were from Fiji) while 4.7% used the devices for electronic Bible, workshops and recordings (these participants were from Tuvalu).

Student Experience (before the survey)

Meanwhile, the remaining 41.8% of the participants stated absence of experience in tablet device usage (23.2% from Fiji and 18.6% from Tuvalu, respectively). The reason for this was attributed to

Figure 4. Device ownership of the student from Fiji and Tuvalu enrolled in UU100

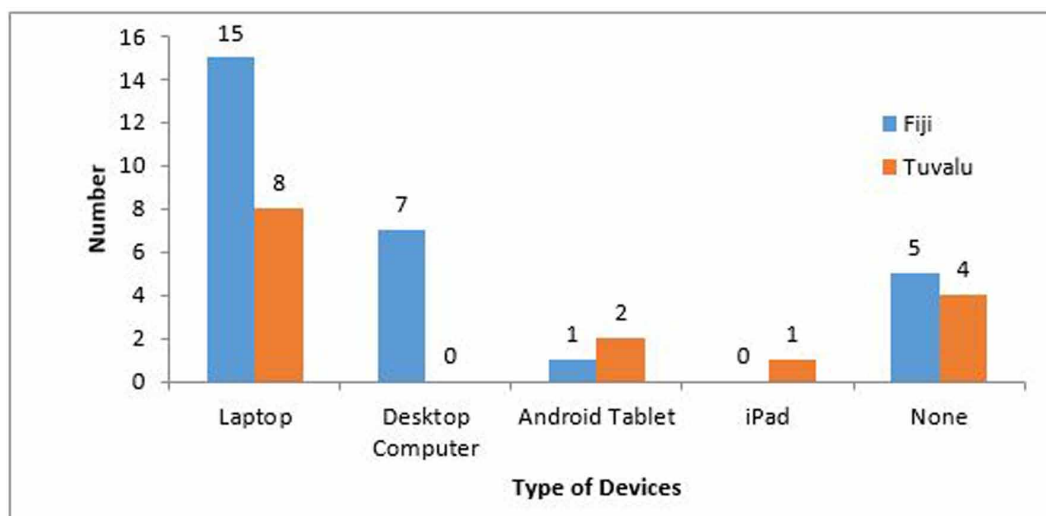
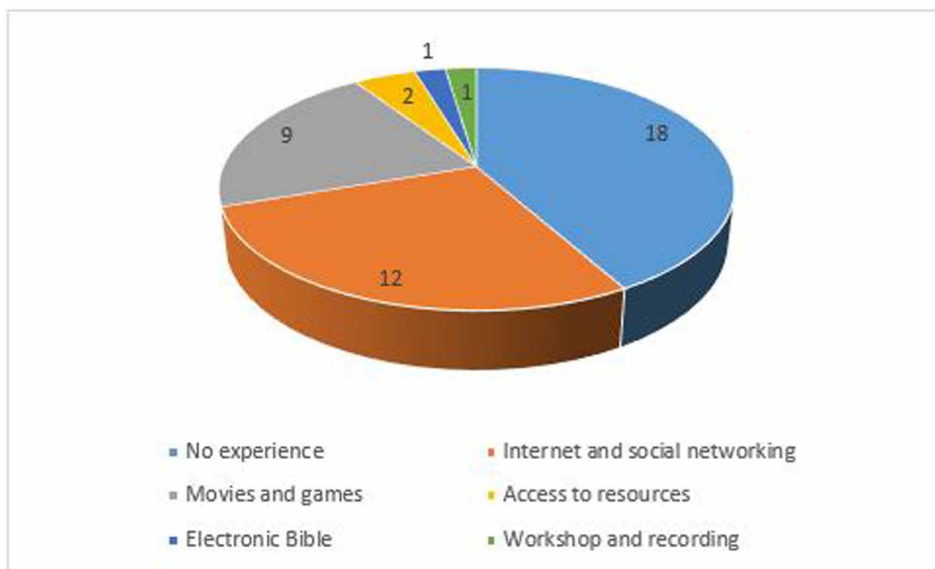


Figure 5. Students experiences in using their devices before the survey



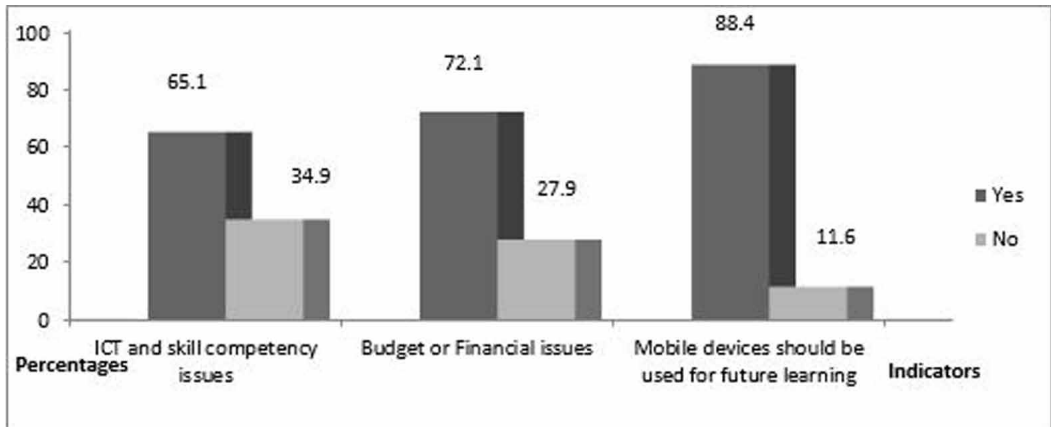
financial constraints that kept them away from buying a device of their own, lack of prior exposure to new technology in their respective locality and lack of knowledge and training on the using of devices. An interesting observation emerged that the majority of the participants citing inexperience with tablets were females. The male participants were more engaged with mobile devices, while the females were engaged more in activities which are more commonly tagged to the females in the Pacific like household chores, weaving, socializing and religious activities.

Student Readiness

From the students' responses, three different themes were identified and classified (figure 6):

1. **ICT and skills competencies**-for students to take full advantage of the tablet device for learning, the level of competency was an issue. Here, 65.1% of the participants had faced difficulties in regard to the use of mobile devices. Students indicated that they needed proper training in using distinctive features in order to complete their prescribed assessments. For example, downloading of different formats of files, saving the documents, and using various apps and transferring files were some of the issues encountered by the students in the blended course.
2. **Budget or financial issues** –A total of 72.1% of the students were unsure about investing into a tablet device for learning purposes. The participants indicated that although their printing cost was highly reduced, they would still face financial difficulty in securing apps for learning and for the maintenance of the device. In addition to this, the participants highly supported the option of hiring the tablet devices from the university for specific periods.
3. **Tablet devices to be used for future learning**- A large proportion (88.4%) of the students agreed that tablet devices should be used for higher learning due to the fact that they were more efficient and effective when compared to other learning devices especially the laptops and the notebooks. The mobile devices were also portable, ease of use and enhanced their creative thinking skills. The devices helped them to discover a lot of things and helped them to share information with each other especially during group activities.

Figure 6. Student readiness divided into three indicators from the participants of Fiji and Tuvalu



Students Perception

Figure 7 illustrates students' perceptions of the tablet devices as an effective tool for learning. According to the results, 34.9% of the respondents cited the ability of the tablet devices to provide access to the course resources. Since, the devices were pre-loaded with course notes, help guides and videos, the participants found them to be good e-repositories for their courses. In addition, since they were able to get connected to their local campus Wi-Fi network through their tablet devices, participants highlighted the advantage of ready access compared to waiting times involved in securing a free PC in the campus labs for these. The Wi-Fi availability also enabled independent exploration of various tablet features and upskilling the student knowledge of using devices as a learning tool, according to 18.6% of the students surveyed. Moreover, the portability factor of the tablet devices was also highlighted in the survey by 16.3% of the respondents. Additionally, this also promoted advance learning, thus enabling better preparation of students for their classes. Finally, 14% of the students indicated that the devices also empowered students to share and communicate, thus developing new skills and exploring new ideas of learning.

Figure 8 displays the participants' views on tablet devices as an effective collaborative and engagement tool. A total of 23.3% of the participants indicated that the device portability made it a more convenient tool for collaborative discussions. The learning and discussions were carried in students' own space and at their own time. The participants also stated that the tablets made their classroom learning experience more interesting as they were able to record their sessions and in parallel use their devices to search the Internet to provide examples to their facilitators related to the concepts being discussed. Thus, the students were able to actively engage inside and out of the classrooms. For group interactions, 34.8% of the participants indicated that the tablets enhanced group interaction as they were able to share ideas and data amongst their group, have effective discussions when they were assigned group activities. The tablet devices also enabled the participants to keep track of their progress in the course through the Moodle marksheet, course news and announcements forums, and Moodle messages.

DISCUSSION

Student readiness, utilization and perception towards the use of tablets for learning is very important for any ELearning environment to be effective. Studies conducted by Angus (2016), Bernado (2013) and Alsulami (2016) show that students have a positive attitude towards using mobile devices for

Figure 7. Student perception of tablet devices as an effective learning tool

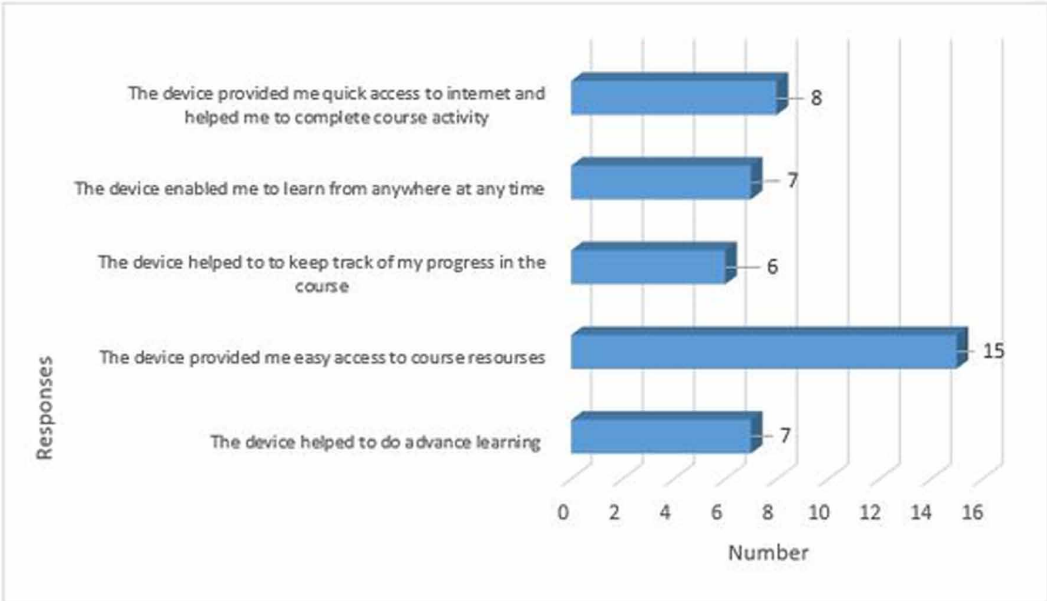
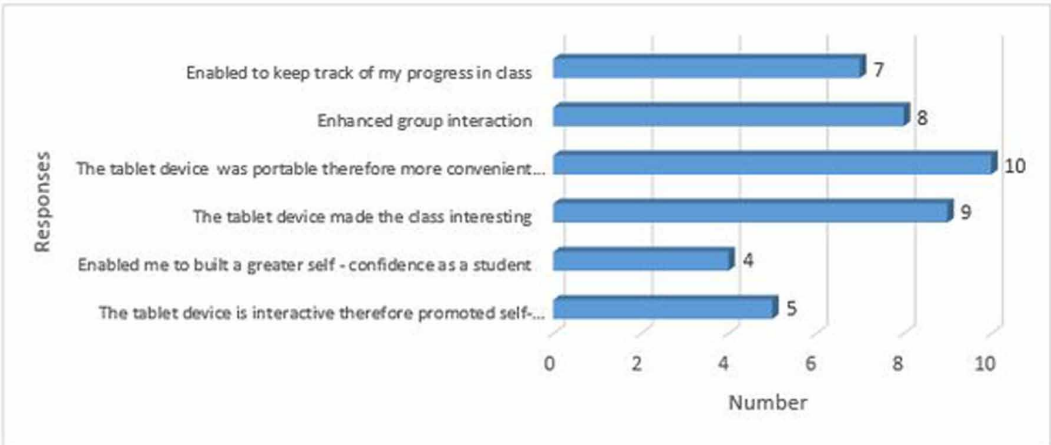


Figure 8. Student response on ways the devices were collaborative and engagement tools



learning. The current climate of using tablets for learning in this 21st century has also been adopted in the Pacific. Just like other universities conducting the pilots for learning with iPads, in the Pacific, USP is giving free tablets to its 1st year students who have paid their fees in full (Narayan & Sharma, 2017). Although the university has introduced the concept of tablet learning there is no baseline survey that has been conducted to show that that the students are ready for tablet learning. This

study was conducted to evaluate the perception and attitude of students towards tablet learning. This quasi-experimental research investigated the student readiness, perception and the utilization of tablet learning devices for higher education in the Pacific region. The study focused on first year students in higher education from 2 Pacific island nation; Fiji and Tuvalu.

Student Readiness

In higher education the successful implementation of tablet learning for mobile learning cannot be achieved without student acceptance of the devices for learning and active participation (Iqbal and Bhatti, 2015). In this study, a little over half (58.2%) of the participants were experienced in the use of tablet devices. The participants responded in favor of using tablet devices for learning in their current blended course and for future learning. The findings indicated that the student readiness is depended on ICT and skills competencies – students required proper training on the use of the tablet learning devices so that maximum utilization of the devices for learning could be garnered.

This study provides a feedback to the facilitators and higher educators to consider the impactful factors before proceeding to include tablet learning to upfront teaching and learning. Previous studies with USP students show that there were likely to be various drives behind the choice to study and this may affect their learning overall (Brown et al., 2015).

Student Perception

The more favorable attitude the students have, the stronger is the individual's intention to perform (Tagoe and Abakah, 2014). This study measured student perception towards the extent to using the tablet devices for their distance learning courses in the Pacific. From the results gathered, it can be assumed that the participants had positive attitude towards tablet learning.

The responses from the participants showed that they considered the tablet devices as a good tool for learning due to compelling reasons of device portability, easy access to course resources (offline e-repository) and good storage medium. The devices also proved to be a good communication tool-improving the collaboration between the facilitator and student and amongst students. The devices acted as a good engaging tool whereby students used the devices for, and not limited to, capturing raw data for weekly activities, keeping track of their progress in course and keeping themselves updated with regular news and announcements. This study aims to confute the claims of the background studies carried across the worlds except the Pacific that the tablet devices are preferred by student for learning due to its desirable properties such as digital texts and readings which lead to substantial cost savings for students, and encourages greater interaction and creative thinking (Mahat et al., 2012; Al-Fahad, 2007; Reddy et al., 2017).

As stated by Al-Fahad, capturing pictures, instant messaging, online chats and emails are familiar to students and keep students engaged (2007). Therefore, it can be said that the students had positive attitude towards using tablets for learning. We have also found in earlier studies that there is a lingual diversity at USP (Brown et al., 2014) and any association of this with technological familiarity and resultant learning would be an interesting future study.

Student Utilization

The study has also shown that over time, device usage evolved from initial use of the tablet devices for personal use such as listening to music, storage and for social networking sites to learning activities, such as accessing course resources, attempting quizzes, keeping track of their progress in courses and also the interaction with the facilitator and peers. The tablets also promoted self- learning due the portability of the devices and access to internet through these devices. The tablet devices proved to be an effective learning and collaborating tool for higher education.

This study acts an initial guide to help identify ways to develop strategies on how to use tablets for learning in the Pacific can be enhanced. A follow-up study with results is recommended so that useful information is provided for educators in the Pacific for future implementation.

Limitations of the Study

This study was one of the 1st ones in the Pacific conducted to evaluate the readiness, perception and utilization of the tablet devices for learning. There is not much literature or background studies on tablet learning in the Pacific. The results are related to a very small sample due to the fact the number of devices available for the study was limited and a major reason for having only 2 campuses considered as part of the study group. Though there was a scarcity of resources available to conduct the study, this study gave a cusp of student readiness, perception and utilization of tablet devices for learning. Another limitation of the study was connectivity on campus. There were other challenges faced by students which are highlighted in this study. The insights provided can be used by relevant stakeholders to improve the implementation of tablet learning in future. Also, follow-up studies can be conducted with a larger population to garner the changes that has taken in the years after this study.

CONCLUSION

The significant increase of ICT usage in education has made it possible for the wireless mobile devices to be used as a teaching and learning tool. Recent works have all defined the use of mobile devices to be common amongst the youths in the Pacific region, who are actively using these devices for social purposes and to some extent, learning. The University of the South Pacific, a higher education provider in the Pacific, has integrated smart media and adopted mLearning system to motivate its students to learn and take advantage of the new learning pedagogies to promote life-long learning. On the other hand, the readiness and perception of using the mobile devices for learning in the Pacific region is yet to be investigated and interventions recommended from baseline surveys.

This study provides an initial feedback of student perception towards mobile learning using tablet devices. The results of this study showed that the majority of students were either inexperienced in using the tablet devices for learning or had mostly used the devices for social purposes such Facebook, email or communication. While the concept of using mobile devices for learning in the Pacific is still in its infancy state it did not stop the students from experimenting, some 88.4% of the participants stated that the tablet devices were an effective and efficient learning tool. The survey also indicated that the students were in favor of using the tablet devices for their learning in future due to the fact that tablet devices are portable and easy to use therefore learning can take place at convenient times and locations. The results of the survey also showed that students perceived tablet devices to be a good collaborative and engaging tool that enhanced and boosted their learning experiences at higher education. Furthermore, mobile devices made a positive impact on the students despite limitations such as: ICT competencies, budget and technological and connectivity issues.

Mobile Learning is a new learning paradigm for future education in the Pacific region. For a prosperous and sustainable mobile learning in the region, it is recommended that more awareness sessions, training and workshops for students and facilitators be conducted before introducing it to the upfront teaching and learning process.

RECOMMENDATION

As a conclusion of this survey, the recommendations to the relevant authorities concerned are:

1. The practice of using tablets for learning should begin at primary and secondary levels of education.
2. Computer education should be made mandatory for all students at Secondary levels.
3. Training should be provided to students at Tertiary levels before students use the devices for their academic purposes.
4. Connectivity issues should be looked upon and resolved.

REFERENCES

- Ajoku, L. I. (2014). The Place of ICT in Teacher Preparation and Climate Change Curriculum at the Tertiary Education Level in Nigeria. *Journal of Education and Practice*, 5(13).
- Alexander, R. (2014, November 14). Children, their world, their education. Tide Global Learning. Retrieved from www.tidegloballearning.net/sites/default/files/Birmingham%20Alexander%20Tide%20CPRT%20141121.pdf
- Al-Fahad. (2007). Student's Attitudes and Perceptions towards the effectiveness of mobile learning in King Saud University. *The Turkish Online Journal of Educational Technology*.
- Alsulami, S. (2016). The Effects of Technology on Learning English as a Foreign Language Among Female EFL Students at Effatt College: An Exploratory Study.
- Angus, G. (2016, January 16). Tablet in Schools Project for all Teachers' Colleges. *Jamaica Information Science*. Retrieved from <http://jis.gov.jm/tablet-in-schools-project-for-all-teachers-colleges/>
- Bachmair, B., & Pachler, N. (2015). Ideas in Mobile Learning. *Journal of Interactive Media in Education*. Retrieved from <http://www-jime.open.ac.uk/articles/10.5334/jime.ay/#B10>
- Bernado, A. (2013, September 6). Education in the twenty-first century: the use of tablets reaches the classroom. Blogthinkbig. Retrieved from <http://blogthinkbig.com/education-twenty-first-century-use-tablets-reaches-classroom/>
- Brown, S., White, S., Sharma, B., Wakeling, L., Naiker, M., Chandra, S., & Bilimoria, B. et al. (2014). Attitude to the study of chemistry and its relationship with achievement in an introductory undergraduate course. *The Journal of Scholarship of Teaching and Learning*, 15(2), 33–41.
- Brown, S., Sharma, B., Wakeling, L., Naiker, M., Chandra, S., Gopalan, R., & Bilimoria, B. (2014). Quantifying attitude to chemistry in students at the University of the South Pacific. *Chemistry Education Research and Practice*, 15(2), 184–191. doi:10.1039/C3RP00155E
- Dimitrios, B., Labros, S., Nikolaos, K., Maria, K., & Athanasios, K. (2013). Traditional Teaching Methods Vs Teaching Through the Application of Information Communication Technologies in the Accounting field: Quo Vadis. *European Scientific Journal*, 1–29.
- Duncan, J., & Lee, K. (2007). *M-learning: Finding a place for mobile technologies within tertiary educational settings* (pp. 223–232). Singapore: Ascilite.
- Edgar, D. (2012, October 2). Learning Theories and Historical Events Affecting Instructional Design in Education. Recitation Literacy Toward Extraction Literacy Practices. SAGE Open. Retrieved from <http://sgo.sagepub.com/content/2/4/2158244012462707.full-text.pdf+html>
- Al-Emran, M., Elsherif, H. M., & Shaalan, K. (2016). Investigating attitudes towards the use of mobile learning in higher education. *Computers in Human Behavior*, 56, 93–102.
- Gong, Z., & Wallace, J. D. (2012). A comparative analysis of iPad and other M-learning technologies: Exploring students' view of adoption, potentials, and challenges. *Journal of Literacy and Technology*, 13(1), 2–29.
- GSMA Association. (2015). The Mobile Economy Pacific Islands 2015.
- Haag, J. (2011). From eLearning to mLearning: The Effectiveness of Mobile Course Delivery. Interservice/ Industry Training. *Proceedings of the Simulation and Education Conference* (pp. 3-13). Academic Press.
- Hussein, M., & Cronje, J. (2010). Defining Mobile Learning in Higher Education Landscape. *Journal of Educational Technology & Society*, 12–21.
- International Telecommunication Union. (2015). ICT facts and figures.
- International Telecommunication Union. (2015, June). ITU/Regional Presence. Retrieved from <https://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Documents/Events/2015/June-Pacific-Ministerial-Meeting/USP.pdf>
- International Telecommunication Union. (2015, September). The state of broadband 2015, Annual Report. Retrieved from <http://www.broadbandcommission.org/documents/reports/bb-annualreport2015.pdf>

Iqbal, S., & Bhatti, Z. A. (2015). An investigation of university student readiness towards m-learning using technology acceptance model. *The International Review of Research in Open and Distributed Learning*, 16(4), 83–103.

Joutsenvirta, T., & Myyry, L. (2010). *Blended Learning in Finland*. Helsinki, Finland: Faculty of Social Sciences at the University of Helsinki.

Kamba, M. (2009). Problems, challenges and benefits of implementing e-learning in Nigerian universities: An empirical study. *International Journal of Emerging Technologies in Learning*, 4(1), 66–69.

Kisber, L. (2013). Teaching and Learning in the Digital World: Possibilities and challenges. Learninglandscape. Retrieved from <http://www.learninglandscapes.ca/images/documents/ll-no12-vfinal-lr-links.pdf>

Koh, M. H., & Hill, J. R. (2009). Student perceptions of groupwork in an online course: Benefits and challenges. *International Journal of E-Learning & Distance Education*, 23(2), 69–92.

Mahamad, S., Ibrahim, M., & Taib, S. (2010). M-Learning: A New Paradigm of Learning. International journal of computer science & information. *Technology*, 2(4), 76–86.

Majumdar, P. S. (2006, February 23). Emerging Trends in ICT for Education & Training. UNEVOC. Retrieved from <http://www.unevoc.unesco.org/fileadmin/up/emergingtrendsiniectforeducationandtraining.pdf>

News@USP. (2017, March 29). USP Invests \$700k for mobile learning. Retrieved from http://www.usp.ac.fj/news/story.php?id=2367#.WPXaR_I97IU

Park, Y. (2011, February). A Pedagogical Framework for Mobile Learning: Categorizing Educational Applications of Mobile Technologies into Four Types. *The international review of research in open and distributed learning*. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/791/1699>

Pop, A. (2016, January 16). Blended Learning, E-Learning and Online Learning: What's Important? Distance learning portal. Retrieved from <http://www.distancelearningportal.com/articles/269/blended-learning-e-learning-and-online-learning-whats-important.html>

Prieto, J., Olmos, S., & Perialvo, F. (2013). Understanding mobile learning: Devices, Pedagogical Implications and research lines. ResearchGate. Retrieved from https://www.researchgate.net/publication/283047826_Understanding_mobile_learning_Devices_pedagogical_implications_and_research_lines

Rasheed, F. (2016, October 21). 2017 Budget: Free tablets for teachers to assist in teaching. NST. Retrieved from <https://www.nst.com.my/news/2016/10/182285/2017-budget-free-tablets-teachers-assist-teaching>

Reddy, E., Reddy, P., Sharma, B., Reddy, K., & Khan, M. G. M. (2016, December). Student readiness and Perception to the use of smart phones for higher education in the pacific. *Proceedings of the 2016 3rd Asia-Pacific World Congress on Computer Science and Engineering (APWC on CSE)* (pp. 258-264). IEEE.

Reddy, P., & Sharma, B. (2015). Effectiveness of tablet learning in online courses at University of the South Pacific. *Proceedings of the 2015 2nd Asia-Pacific World Congress on Computer Science and Engineering (APWC on CSE)* (pp. 1-9). IEEE.

Rosman, P. (2008). M-Learning - As a Paradigm of New Forums in Education. *Information & Management*, 119–125.

Rossing, J., Miller, W., Cecil, A., & Stamper, S. (2012). iLearning: The future of higher education? Student perceptions on learning with mobile tablets. *The Journal of Scholarship of Teaching and Learning*, 1–26.

Sharma, B., Jokhan, A., Finiasi, R., & Kumar, R. (2015). Use of Short Message Service for Learning and Student Support in the Pacific Region. In Y. Zang (Ed.), *Handbook of Mobile Teaching and Learning* (pp. 199–220). USP.

Shopova, T. (2012). E-Learning in Higher Educational Environment. *Proceedings of the International Conference-The Future of Education* (pp. 1-5). Academic Press.

Tagoe, M., & Abakah, E. (2014). Determining distance education students' readiness for mobile learning at University of Ghana using the Theory of Planned Behavior. *International Journal of Education and Development Using Information and Communication Technology*, 91–106.

UN.org. (2017). Retrieved from <http://www.un.org/sustainabledevelopment/education/USP>. (2017). Enrolments.

Pritika Reddy is an assistant lecturer in Computing Science and Information Systems at Fiji National University.

Bibhya Sharma is an Associate Professor of Mathematics and the Acting Dean of the Faculty of Science, Technology and Environment (FSTE) at the University of The South Pacific (USP). He first joined USP as a tutor for the School of Computing, Information and Mathematical Science in 1997 and has since progressed to many ranks before being given his current position. Bibhya is very passionate and dedicated with his research in motion planning and control of robots using the Lyapunov-based control scheme and he has made significant contributions to the research area and published in well recognized journals. He is a member of a number of professional mathematics societies and unions and has published more than 100 articles and book chapters in the fields of robotics, biologically inspired processes, and mathematics and science education. He also champions the area of teaching and learning practices of higher education and has had significant contributions in area of science, technology, engineering, and mathematics (STEM) education and new tools and technologies to enhance higher education in the Pacific region. The new FSTE projects including Online Mathematics Diagnostic Tool (OMDT), cohort teaching initiatives such as the In-country Science Programme and the Science Teachers Accelerated Programme, Tablet Learning Project, mLearning apps and tools and the Faculty Online Orientation Tool are his brainchild.

Shaneel Chandra is a lecturer and Head of Course for Science, Chemistry at Queensland University.