

Mobile Learning Practice in Higher Education in Nepal

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Abstract

During the 15 years of this current century, mobile technology has become a leading technology in the support of educational outcomes. This study investigated the mobile learning practices among undergraduates in higher education in the semi-urban and rural areas of the Gorkha district of Nepal. The objectives were to explore the availability of mobile technology for learning; its costs; learning trends, institutional policies, and attitudes towards mobile learning. These factors were explored to identify implications for pedagogical practice. The study adopted a mixed methods design, in which the quantitative data were collected by using a questionnaire with a sample of 161 undergraduates from six campuses. The qualitative data were collected from 19 purposively selected respondents by the way of semi-structured interviews. The result indicated that virtually all undergraduates possessed their mobile phones and used them informally for learning both inside and outside of their classes. The majority of the students had positive attitudes towards mobile learning. However, many were not satisfied with the effectiveness of their practices or with the level of institutional support for using mobile devices to support their learning. Although comprehensive mobile learning is not widespread in Nepal, enriching conventional learning by the incremental use of mobile devices is possible in Nepalese institutes of higher education. I conclude that teachers and institutions should provide guidance to students about the effective uses of mobile technology because successful use of technology in learning largely depends on appropriate pedagogy and teacher support.

Keywords: Mobile learning; Nepal; higher education; electronic learning; educational technology; digital divide

Mobile learning has become a distinctive area of modern digital learning. The United Nations Educational, Scientific and Cultural Organization (UNESCO) celebrated a Mobile Learning Week in February 2015, with the theme “leveraging technology to empower women and girls” (UNESCO, 2015). Its mission was to close the gender gap by promoting women’s learning in developing countries with affordable handheld technology. The conference was an example of the impact of mobile learning across the world. Increasing numbers of conferences, workshops, seminars, and journal publications on mobile learning provide testimony to the influence of mobile learning across the world (Ally, 2009; Traxler, 2007). This paper discusses mobile learning practices among undergraduate students in rural areas of Nepal and considers Nepalese readiness to adopt mobile devices for learning in higher education.

Theoretical framework for mobile learning

Mobile learning is an emerging phenomenon and its effective use is presently unclear (Traxler, 2007; Mehdipour & Zerahkafi, 2013). Kukulska-Hulme (2009, cited in Shrestha, 2011, p. 108) argued that “mobile learning is a tricky term as mobility refers to mobility of technology, content and learners in the context of learning”. There appears to be no consensus about how to conceptualise or define it (Ally, 2009). Mobile learning is often viewed as an updated version of e-learning, which incorporates learning experiences with electronic devices. Mehdipour & Zerehkafi (2013) claim that there is a whole part relationship between e-learning and mobile learning in the wider context of digital learning. This view considers mobile learning as a part of e learning. Their relationship can be illustrated in Figure 1.

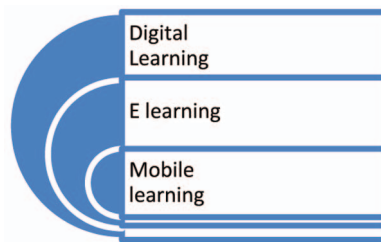


Figure 1: Relationship between mobile learning and e learning

Figure 1 shows that mobile learning is a part of e-learning. Similarly, e-learning is a part of modern digital learning. Mobile learning can be viewed as a paradigm shift within the framework of e-learning. E-learning is often equated with the Internet connected desktop computer based learning experiences. Mehdipour and Zerehkafi (2013) drew a distinction between e-learning and mobile learning.

E-Learning can be real-time or self-paced, also known as “synchronous” or “asynchronous” learning. Additionally, E Learning is considered to be tethered (connected to something) and presented in a formal and structured manner. In contrast, mobile learning is often self-paced, un-tethered, and informal in its presentation (p. 9).

Traxler (2007) claims that the distinction between e learning and mobile learning is blurred because mobile technology has largely overcome previous barriers of effective mobile learning. For example, mobile devices have considerable connectivity, screen size, storage, and processing power. Consideration of the definitions of mobile learning is necessary for enabling a detail discussion on it.

In essence, mobile learning is learning with a mobile hand held electronic device, at any time, anywhere (Kukulka-Hulme & Shield, 2008, as cited in Shohel & Power, 2010). In a broad sense, mobile learning refers to any learning that occurs when the learner is not at a fixed, predetermined location, or learning that occurs when the learner takes advantages of opportunities offered by mobile technology. In a narrow sense, O’Malley et al. (2005) stated that mobile learning refers to any kind of learning experiences with handheld mobile devices that take place both inside and outside the classes. This article views mobile learning as any kind of learning experience gained with portable digital devices both inside and outside the class.

The concept of mobile learning is in consistence with the modern concept of lifelong learning. Sharples, Taylor and Vavoula (2006) observed a convergence between modern form of learning and technology. They stated that new technology (personal, user-centered, mobile, networked, ubiquitous, and durable) is suitable for new learning (personalized, learner centered, situated, collaborative, ubiquitous, and lifelong). They outlined some assumptions of mobile learning, which reflect the views of twelve Mlearn project research leaders from various countries of world. They viewed that learner as mobile and learning is interwoven with other daily activities. The control and management of learning can be shared between teachers and students. The learners through interactions create learning context. Learning can fulfill goals and set new goals. Mobile learning can complement and conflict with formal education. Ownership of learning and privacy are ethical issues in mobile learning. Rapid advancement and diffusion of technology in rural areas provide learners with opportunities to connect them with the larger learning communities outside their classes. This study was based on these assumptions of mobile learning.

Advantages of mobile learning

The discussion about the advantages of mobile learning began from the beginning of this century. The first Mlearn conference was organized in Birmingham in 2002 (Traxler, 2007). Initially, mobile

learning was seen as an innovative use of the latest information and communication technology in education when voice call and text messaging were the main features available in mobile devices. Currently, the development of portable, handheld mobile devices with Internet connectivity has offered greater access and possibilities for interaction and collaboration among teachers and students. Media rich capabilities such as, decreasing weight, wider screen size and high resolution, high storage and processing speed, extended battery backup are fueling a transition to a 'Mobile Age' (Lee & Chan, 2007).

Mobile learning has a number of benefits. Mobile learning provides learning opportunities inexpensively because the cost of mobile devices is significantly lower than PCs and laptops. It also reduces the burden of buying several gadgets since it has the capacity to create and deliver multimedia contents. This can be used for both continuous and situated learning support. The user-friendly design of mobile devices reduces training costs for the learners and the teachers. It might also provide rewarding learning experiences. They have potential to improve levels of literacy, numeracy, and participation in education among young adults (Mehdipour & Zerehkafi, 2013). Similarly, they can be beneficial for both formal and informal learning because they offer an additional platform for interaction among teachers and learners on the one hand, and sharing content knowledge on the other hand. They can promote learners' active participation in learning process. Research project has confirmed positive outcomes for mobile learning in both formal and informal learning situations (Kumar et al., 2010; Hayati, Jalilifar & Mashhadi, 2013). In the Nepalese context, mobile devices can provide opportunities to access the Internet from remote location.

Nepalese context for mobile learning

Nepalese educational institutions are primarily structured at school and university level. Schools run from pre-primary level to grade 12. Grades 11 and 12 are referred to as the higher secondary level. Universities and other tertiary institutions offer undergraduate to PhD level programs. Schools and undergraduate colleges tend to be located in remote areas.

The advent of mobile phones in Nepalese schools has posed a major threat to the ecology of the school, and school administrators have attempted to restrict their use because it is thought to be disruptive in classrooms (Bishowkarma, 2007). Policy-makers appeared to be unaware of the positive uses of digital technology inside and outside the classrooms. However, students from grades 6 to 10 have been using mobile phones secretly in their classes. The mobile penetration rate was 51.1 percent (Nepal Telecommunications Authority, 2011) when Bishowkarma prepared the report. He reported cases both of mobile use and misuse in schools. His article indicated the emergence of unsupervised mobile learning in Nepalese education.

The Higher Secondary Education Board (HSEB) decided to ban mobile phones in grades 11 and 12 to prevent distractions on study in the school (HSEB, 2013). This issue generated heated debate among educationists, teachers, and students. Though some teachers and guardians welcomed the decision, the students clearly showed their dismay and argued that banning mobile phones is not a solution because a lot can be learned by using information and communication technologies. The HSEB decision has not been strictly implemented because of ineffective monitoring. Most parents and teachers still have reservations about mobile uses in schools. However, mobile learning is increasing in informal learning and this has received very little attention.

Nepal has better infrastructure for mobile communication technology than other forms information communication technology. Nepal Telecommunications Authority (May, 2015) reported that the mobile penetration rate in Nepal was 86% at the end of 2014. In line with other countries, young people, including the university students, comprise the large portion of mobile subscriptions. Wider

accessibility of the technology has increased the possibilities of mobile learning among Nepalese students. Whereas the Central Bureau of Statistics (CBS) reported that only 7% households had a computer in Nepal by 2011 (CBS, 2012), the latest data shows that mobile and internet penetration rates are approximately 101.17% and 44.37% respectively by 17th July, 2015 (Nepal Telecommunications Authority, December 2015). Broadband Internet is available in a small number of cities. Ninety-five percent of users access the Internet by mobile phones. Nepal is making rapid progress in adopting mobile technology, which is a prerequisite for mobile learning. The pace of technological advancement is much faster than their educational application and evaluation (Terras & Ramsay, 2012).

Review of policies and plans for mobile learning

Discussion on information and communication technology integration in Nepalese school and university level education started recently. The government of Nepal has formulated a master plan for ICT integration in education. The vision of the master plan is to “ensure extensive use of ICT in education sector and contribute for access to and quality education for all” (Ministry of Education, 2013, p. 4). It has a policy to bridge the existing digital divide by providing ICT integrated teaching and learning environments. Some pilot programs are assessing the use of information and communication technology in schools. Tribhuvan University (TU) and Kathmandu University (KU) have policies that are designed to support the use of computer technologies for open and distance education students.

TU has taken some initiatives to integrate information and communication technology (ICT) in higher education. TU Faculty of education offers teacher preparation course (B.ED in ICT) and Faculty of Management offers Bachelor of Information Management (BIM). Institute of Engineering has Centre for Information Technology (CIT) and Information & Communication Technology Centre (ICTC). TU established the Open and Distance Learning Center in 2015, which aims to “provide access of quality higher education to mass people in Nepal through open and distance mode”. The center will also support other institutions to integrate e-learning by hybridizing traditional education programs as a gradual transition to virtual learning (ODEC-TU, 2015). The Center will develop android application to assist learning (Adhikari, 2015). This initiative endorses mobile learning formally in the Nepalese higher education sector. The Center will develop resources and train faculties to promote information and communication technology in open and distance education. In this context, mobile technology can bridge the digital divide by offering an alternative technology for learning. Mobile learning based on new developments in mobile technology is an emerging trend in Nepalese higher education. Mobile devices might be an alternative technology to integrate information and communication technologies in Nepalese education. However, it is too early to predict how these initiatives will change Nepalese education. It is important for universities to examine students’ current mobile learning practice before implementing new modes of learning.

Research on Mobile Learning in Nepal

There is a scarcity of research studies on mobile learning in Nepal. No formal research reports appear to have been published. However, there are a few magazine, journal and blog articles. Bishowkarma (2007) stated that he did not find any formal research on mobile learning in Nepal. His article published in *Sikshak* magazine shed some light on the issue. He pointed out threats and prospects for mobile learning in Nepalese schools. Based on a field survey carried out by *Sikshak* magazine inside the Kathmandu valley and other districts (Tanahu, Biratnagar and Jhapa), he reported that a large number of school students beyond grade 6 had carried mobile phones in class.

Schools had attempted to ban mobile phones in but these attempts have been mostly unsuccessful. The survey revealed both uses and misuses of mobile phones. Few students used mobile phones for learning word meanings, discussing homework, or solving arithmetic problems using the calculator features. They used the alarm feature to wake up in the morning. They listened to music and the radio, watched videos, browsed the Internet, and updated Facebook. On the darker side, the survey also revealed that some students watched pornographic videos and photos. Some students reported that they were bullied using mobile phones. Shrestha (2012) conducted research in some schools in the Chitwan district in Nepal with low-cost open-source mobile devices, specifically Ben Nanonote and Wikireader to access offline sources. His study showed that learning with mobile devices promoted student centered learning. He noticed the scarcity of appropriate content customized for Nepali learners. No previous research appears to exist on mobile learning practices among university students in Nepal.

Framework of the study

Mobile learning practices depend on several variables. This study¹ investigated some major determiners of mobile learning practices. The key variables of the study are presented in the diagram in Figure 2.

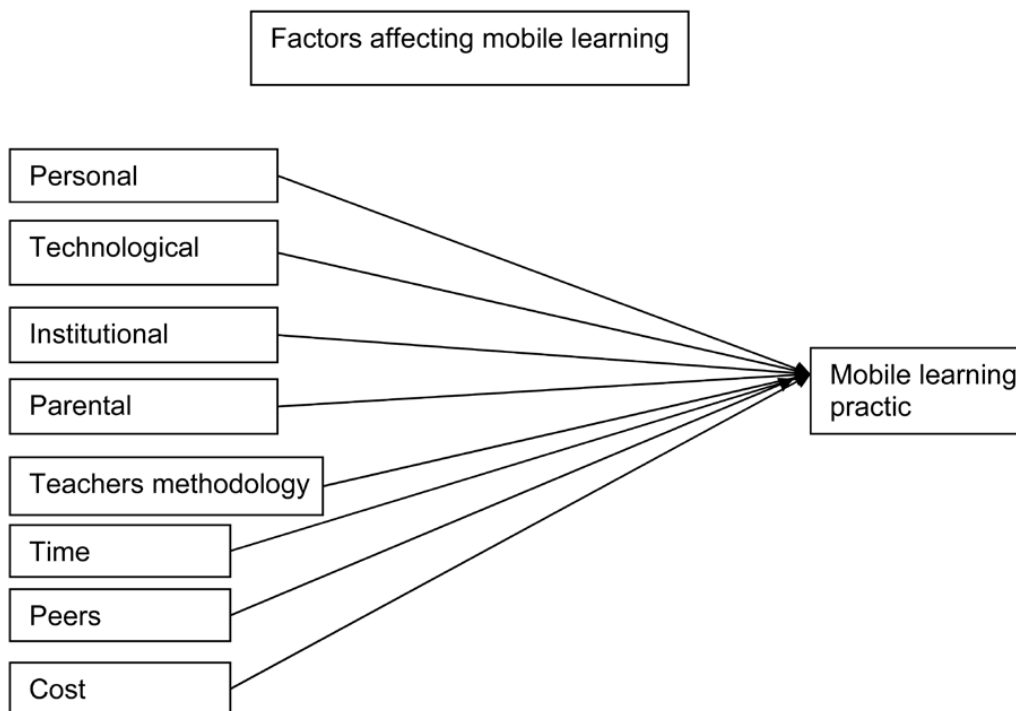


Figure 2: Factors affecting mobile learning practice

Figure 2 presents factors that affect mobile learning. Students' mobile learning practices depend on personal factors like age, gender and interest. Type of devices, network availability, battery backup, screen size and resolution, apps and other features available in the devices are some of

¹ This study was conducted in May 2014, one year prior to the great earthquake in Nepal which badly affected the Gorkha District where this study was conducted.

the technological considerations, which influence actual uses of mobile for learning. Similarly, institutional policy, the nature of curriculum and the assessment system also influence teaching methodology. Other important factors include teachers, parents, and peers' support for mobile learning. Theoretically, mobile learning takes place at any time anywhere (Kukulka-Hulme & Shield, 2008, cited in Shohel & Power, 2010). However, students' time for other activities, such as part time employment, and family commitments might contribute to variation in the mobile learning practices. Cost of devices, call rates, mobile data charges, availability of Wi-Fi for internet connections are some of financial considerations, which might also limit the use of devices.

Significance of the study

It can be seen from the discussion above that mobile learning has received mixed attention in Nepal. Mobile learning research has attracted few researchers. No one has carried out comprehensive research in Nepalese higher education yet. In this context, investigating students' current mobile learning practices will be significant since it will provide some descriptive data for educational policy maker, planners, administrators, and teachers.

Objectives of the study and research questions

The main objective of this study was to explore the mobile learning practices of university level students in Nepal. Its other objectives were to explore the availability of technology, financial consideration of mobile learning gadgets, data charge, students' affordability, institutional policy and practices, teachers' and parental support to students in mobile learning. It also aimed to suggest some implications for teaching learning and research.

This study was designed to answer the following research questions:

1. What is the technological and financial readiness for mobile learning among undergraduate students in rural areas of Nepal?
2. How do students use their mobile devices for learning?
3. What are their views on mobile learning?

Method

Research design

This research used a mix methods design employing both quantitative and qualitative techniques in a two-phase sequential data collection process, as an exploratory and descriptive research project. A student survey was conducted with a questionnaire containing both closed and open-ended questions. After the initial analysis of survey data, for more comprehensive data on mobile learning across the diverse background of participants within the district, semi-structured interviews were carried out with students selected by judgmental sampling. The interviews helped to clarify and interpret trends and issues that emerged from the open-ended section of the survey.

This research was carried out in the Gorkha district of Nepal. It is located in mountainous area about 140 kilometers west of Kathmandu, the capital city of Nepal. There are six campuses of Tribhuvan University (TU) in the district. Two of campuses have limited access to the Internet mostly for administrators and faculties. Two are in the district headquarter, which is in semi urban area. Others are in rural area. All the campuses run classes in the morning. Most of the students are from rural areas. Most come from farming family and help their parents in farm duties in the afternoon. They spend considerable amount of time walking to and from campus because of limited public transport. Female students outnumber male students in all the campuses.

The population of the study was all of the undergraduate students at six campuses of Tribhuvan University (TU). One of them was the constituent campus of TU, and the others were affiliated campuses. The sample comprised 161 randomly selected undergraduate students (40 men and 121 women), with ages ranging from 17 to 28 years. Nineteen students (3 men and 16 women) were selected through judgmental sampling for in-depth interviews; these students included those with a disability, those with different types of mobile devices, and students from different geographical and cultural backgrounds.

Data collection and analysis

To survey students' demographic data, mobile learning practices, and attitudes towards mobile learning, a questionnaire was constructed which contained both open ended and close questions. The initial version of the questionnaire was based on the author's ideas on important issues on mobile learning and informal discussion among colleagues. To ensure content validity, first it was sent to three experts, including one who was working in open and distance learning for their feedback. After reviewing their feedback, the modified questionnaire was piloted with 10 students at Drabya Shah Multiple Campus. Following information received from the pilot study, some questions were removed, and for example, information on mobile brand, and number of years they were using mobile phones and how often they changed their mobile phones. The final version of the questionnaire consisted of five sections. The first was to obtain demographic data, the second focused on access to technology, the third was on general uses of mobile, the fourth section on academic uses and the final section was on students' perceptions of other issues relating to mobile learning.

The revised questionnaires were administered to the target students in their class in the target campuses after gaining consent from campus authorities. The students were assured of the privacy of their responses. The respondents were given freedom to maintain their anonymity. They voluntarily participated in the survey. After the initial analysis of the survey, 19 students were interviewed for in-depth information on their practices and their expectations regarding mobile learning, using an interview guide. Six questionnaires were discarded because they were not completed. It was also found that some of the respondents missed some of the open-ended questions, which did not affect the analysis of questionnaire.

The researcher administered the questionnaire in person to ensure that participants could seek clarification of the questions on the spot. Most of the questions were answered with relevant information. The researcher interviewed the respondents individually. They could freely share their experiences.

The closed ended questions were coded and analyzed using the Microsoft excel program. Simple descriptive statistical procedures were carried out on the quantitative data. Similarly, content analysis of mobile uses in general, mobile learning activities, challenges and their attitudes on mobile learning, teachers' behavior, and parental support were performed on the qualitative data to describe the data trends.

Results

Quantitative data

Demographical profile of the respondents: The first section of the questionnaires had questions on the background information of the respondents. An analysis of the first section of the questionnaire generated a demographic profile of the respondents, which showed that 75% of the respondents were women and only 25% were men. Their ages ranged from 18 to 28 years with a mean age 20.22 years, and a standard deviation (SD) of 1.93. Each campus in the district was represented

in the study with 28% of the sample from Drabya Shah Multiple Campus, 34% from Gorkha Campus, 10 % from Bhimodaya Campus, 13% from Bhawani Multiple Campus, 9% from Dullav Multiple Campus, and 6% from Paropakar Multiple Campus. The sample comprised 25% of the respondents from the Faculty of Management, and 75% from the Faculty of Education. The majority of the respondents (77%) were full-time students.

Accessibility and cost: The second section of the questionnaire explored students' accessibility to mobile technology and financial costs. All students had a mobile phone. Almost half of them (45%) had smart mobile phones and a little more than half of them (55%) had basic mobile phones. However, only 24% of them had computers (17% laptop & 7% desktops). Similarly, 32% had a digital camera, 5% had an iPad and 24% had Mp3 players. Mobile Internet use is popular in Nepal. Seventy-nine percent of respondents had Internet connections on their mobile phones. The average price of their mobile phone was Rs 7,440 (\$US74.40). Seventy-seven percent of the respondents paid less than Rs 10,000(\$US100) for their mobile phones. The average monthly expense of respondents was Rs288 (\$US2.88) per month. Almost half of them spend around Rs 200 (\$US2) per month for making calls and for data use.

General uses of mobile technology: The third section of the questionnaire sought to find how the respondents used their mobile phone in day-to-day life. All of the respondents used their mobile phones for making phone calls and sending text messages. Email was used by 40% the respondents, 68% of them used their mobile devices for entertainment, 50% used them for browsing the internet, 81% for playing games, 58% for social networking, 65% for reading online news, and 90% used them for taking photos.

Mobile learning practices: The fourth section investigated students' mobile learning environments and practices. The majority of the respondents (82%) used their mobile devices for learning outside their classroom. Only 18% of the respondents stated that they wanted to use their mobile devices in class. Home is their favorite place for mobile use (80%). Nobody reported that the classroom was their favorite place for mobile learning. Thirty percent of the respondents were not sure whether they could use a mobile device for learning in the class or not. One-third (33%) reported that they were not allowed to use mobile phones in class whereas 37% reported that they were allowed to use mobile phones for learning in class. The majority of the respondents (55%) reported that they did not get any support from their teachers for mobile learning.

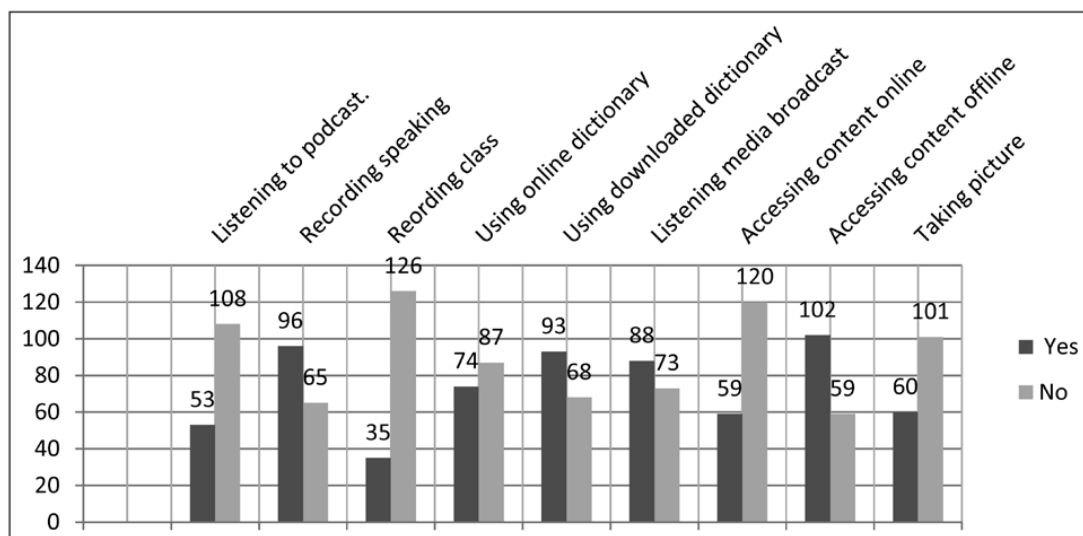


Figure 3: Uses of Mobile Phones for Learning

Figure 3 shows how different functions of mobile phones were used for learning purposes. The majority of the respondents (74%) used their mobile device for using offline (downloaded content). On the other hand, only 59 (36%) of the respondents used their mobile for accessing online content. Similarly, 54% of the respondents used their mobile to listen to media broadcasts. Figure 3 also reveals that a large number of respondents (60%) used their mobile for recording their English speaking practice. Likewise, 46% respondents used an online dictionary and 58% of the respondents used off-line dictionaries. Figure 3 also indicates that a small number of respondents recorded (22%) class discussions.

The fifth section was developed to explore students' perceptions of mobile learning practices. This section contained 12 Likert type items. Respondents were asked to respond to statements on a five point scale ranging from strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1).

Table 1: Likert Scale Mean Scores for Students' perception of mobile learning

S. No	Statements	Agreed	Undecided	Disagreed	Mean	Standard deviation
1	Mobile phone can facilitate learning.	141(88%)	16(10%)	4(2%)	4.2	0.77
2	The campus administration should allow students to use mobile in the class for learning purpose.	126(78%)	21(13%)	14(9%)	4.02	0.99
3	Students need orientation/training for mobile learning.	418(86%)	20(12%)	4(3%)	4.37	0.82
4	The campus administration should ban on mobile phone use in the class	31(20%)	14(9%)	115(71%)	2.29	1.15
5	Students will use mobile appropriately in the class if they are allowed to use	91(57%)	37(23%)	33(20%)	3.47	1.10
6	Teachers should guide students for effective mobile learning.	136(84%)	16(10%)	9(6%)	4.15	0.90
7	Mobile phone hampers study.	58(36%)	59(37%)	44(27%)	3.16	1.10
8	Mobile learning can replace traditional face to face class	51(32%)	7(4%)	103(64%)	2.47	1.36
9	Mobile phone narrows down the digital divide existing in the country.	123(76%)	25(16%)	13(8%)	3.95	0.98
10	Mobile learning should be integrated in formal education system.	123(76%)	25(16%)	13(8%)	3.85	0.82
11	Parents have positive attitude towards mobile use for learning.	79(49%)	34(21%)	88(30%)	3.27	1.20
12	Teachers have positive attitude towards mobile learning.	83(52%)	42(26%)	38(22%)	3.28	1.13

Note: Likert scale was designed with five points. Strongly agree and agreed have been grouped under agree and strongly disagree and disagree have been grouped under disagree in the table.

Table 1 shows that the majority of respondents clearly agreed with the positive role of mobile devices in learning (Mean = 4.2/88%) and a similar number expressed the view that students should be allowed to take mobile devices to class (Mean = 4.02/78%). The table also shows that almost two thirds of the respondents were against banning mobile phones in class (Mean = 2.29/71%). A little more than half of the respondents agreed that they would use their mobile device appropriately if they were allowed to use it in the class (Mean = 3.47/57%). The table also indicates that they wanted some sort of orientation for mobile learning (Mean = 4.37/86%), and nearly the same percentage agreed that teachers should provide guidance for mobile learning (Mean = 4.15/84%). The respondents had mixed views about the negative potential of mobile devices on learning. Thirty six percent agreed that mobile devices had a negative role, 37% were undecided, and 27% disagreed about the negative role of mobile devices on learning. Relatively, large numbers of respondents disagreed that mobile learning can replace face-to-face learning (Mean = 2.47/64%). The data showed that they favored a blended learning mode. Similarly, they agreed that mobile phones could narrow the existing digital divide in the country (Mean = 3.95/76%). Furthermore, almost equal numbers of students agreed that mobile learning should be integrated into the formal education system (Mean = 3.85/76%). However, only about half of the respondents agreed that their parents and teachers had positive attitudes towards mobile learning.

Results from interviews

The following themes emerged from the analysis of the interview data.

Listening to audio books: Although it is not a very popular activity, some students learn by listening to downloaded material on their mobile devices. Students download some audio novels or stories and listened to them. Some of them listen to course related content. A visually impaired participant reported that she regularly listened to course related content on her mobile. “We do not have books in Braille. Some audio books are available. I have downloaded them on my memory card and I listen to them whenever I want. They are blessing for us. We can study whenever we want” (Participant 1). She also had planned to record her English textbook, which was not available in audio format, asking her teacher to read for her.

Recording class lectures: Most of the students record their spoken activities and listen either for learning or for entertainment. Some students secretly record their teachers’ class lecture. Participant no 4 admitted that she recorded class lectures. “I have secretly recorded class lectures several times but I fear a lot. I think if the teacher knows it, he will be angry with me” (Participant 7).

Dictionary use: Dictionary use is a popular function of mobile devices. The students use both on line and downloaded dictionaries on their mobile phone. One participant said, “Mobile dictionaries are easier to carry and faster to find words” (Participant 6).

Web searches: The study also shows that the respondents use the Internet function on their mobile devices. One of the participants said, “I remember I had searched various reasons for learning English on the Internet” (Participant 4). Another participant said, “I get confused with large amount of information after Google search. I cannot choose appropriate content “ (Participant 5).

Phone calls: Some participants reported that they made phone calls to their teachers for learning. However, they reported that they phoned their friends and discussed their course while preparing for exams. “I had a problem with one question. Then I called one of my friend she helped me to find answer” (Participant 4).

Chat: Some of the participants admitted that they did not discuss course content on Facebook and other Messengers site. However, they kept track of course while chatting if they could not go to campus. “I ask what happened in the campus and what was taught in the class if I missed my class while chatting on Facebook” (Participant 11).

Photographs: Participants used their camera function to learn. They reported that they took photographs of different books or board and readings. “My friend and I have different writers’ books. When I find a useful text in her book, I capture the text with my mobile phone. It saves my time to copy. I can easily collect text from different sources” (Participant 7).

Calculators: Many students used their mobile for calculating.” As it is readily available, I use it for simple calculation” (Participant 11).

Discussion, Conclusion and Recommendations

The present study gathered and analyzed data to understand current trends regarding mobile learning practices among undergraduates in the Gorkha district of Nepal. The result confirmed that students generally have a sound technological understanding and positive attitude towards mobile learning. Almost all of the students have a mobile phone with a good number having smart phones. Cost of technology is an important issue. They can buy low price smart phones. However, use of the phones for learning is expensive. No higher institution provides free Wi-Fi facilities for the students in the district. It is expensive for the students to download audio and visual learning material with a mobile data service on the one hand and poor speed and connectivity are other issues with Internet access on the other hand. Although, it is somewhat, some students are using their mobile devices for informal learning. They are using their mobile devices mainly for checking word meanings, browsing the web, and accessing multimedia. It shows that students need to learn and practice several other ways for the optimal use of their mobile devices for both formal and informal learning.

Recently, some universities have initiated few programs with open and distance mode of learning using information and communication technology in Nepal. Mobile phones are readily available in Nepal. Therefore, success of new open and distance programs learning will largely depends on the use of mobile devices as the basic technology of learning. It is necessary for parents and teachers to play a supportive role if mobile learning is enabled to fulfill its potential. Although the present research was based on students in semi-urban and rural areas of Nepal, the findings might be useful for other developing countries where issues of technological and pedagogical developmental are similar.

Challenges of mobile learning in Nepalese higher education

There are numerous of challenges for implementing successful mobile learning practices among university level students in Nepal. These are financial, technological, policy related, pedagogical, and ethical. The cost of appropriate mobile gadgets and operation cost is beyond affordability of students in rural areas. More than half of the students use ordinary cell phones. Smart phones and tablets, more comfortable devices for on screen reading, cost more than ordinary cell phone. Expensive data charges are another financial barrier for Internet based mobile learning. Battery backup, mobile charging with long hours of power outages, poor network connectivity, the small screen size of cell phones, availability of suitable software and hard ware are technological challenges. Open and distance learning mode has just started with few programs. The support system is in the initial stage. Almost all programs of higher education hold face-to-face program which do not recognize the role of information and communication technology in education. Most of teacher use chalk and talk instructional approaches in the class. Unless teacher changes their pedagogy, mobile learning will not be successful.

Contribution of mobile learning to Nepalese higher education

Mobile learning can play a key role in Nepalese higher education by offering an additional platform for learning both inside and outside of the classrooms. Students can be members of a global learning

community and get opportunities to use the vast resources that are available on the Internet. Students and teachers do not need to always be in the same class at the same time for discussions. Learning is integrated with other day to activities. High dropout and absenteeism are common in classes of rural areas. If teachers deliver some lessons for use on mobile devices, it may keep irregular students on track with their learning journey. These can interact with teachers and other students.

Recommendations for the implementation of mobile learning in Nepal

Policy: Although, some universities have introduced open and distance learning courses in few discipline, which use information and communication technology, However, there appear to be no written policies to guide mobile learning practices in higher education. In this regard, universities should formulate policies to recognize mobile learning as a supplementary mode of learning as part of blended learning in higher education. They should introduce hybrid courses at the undergraduate level. Current face-to-face learning can be enriched with the introduction of mobile learning. Every institute of higher education should be supported to develop as a resource and support center for mobile learning practices. This will help to reach more students who live in isolated rural areas of Nepal. The universities and tertiary institution should provide support training, orientation, and research for ICT integration and mobile learning practices on a wider scale.

Operational: Policy should help people to develop understanding of mobile learning. However, the practice causes real changes. Each tertiary institution should create an appropriate environment for effective mobile learning practices. Each campus should formulate a code of conduct for mobile learning practices in the campuses. Teachers and students should set ground rules for judicious mobile learning practices in the class and outside the class for safe learning experiences. Faculties should conduct surveys on available technology and students' mobile learning practices to develop a support system. They should organize seminars, workshops for effective mobile learning practices. They should develop a culture of information and resources sharing. They should develop mobile learning resources and share with the students. Campus administration should update the faculties with the available mobile learning technology. Each campus should provide facilities of Wi-Fi facilities so that students can use the Internet without worrying the mobile data charges.

Pedagogical: Using technology in teaching is not end in itself. How and what students learn with their mobile devices largely depend on how technology is integrated to support teaching and learning process with the technology. Faculties should devise appropriate teaching methods which demands the use of their mobile learning in addition of face to face learning. Faculty members should develop flexible learning and assessment methods. Faculty members should send assignment, feedback, etc on mobile phone. Faculties should record class lectures and share with students, so that students focus on information processing, rather than information possessing.

Limitations and further research

Mobile learning is a complex phenomenon. This descriptive exploratory study assessed current mobile learning trends among undergraduate students in Nepal. The study excluded more mature Masters level students. The study was conducted in public institutions with students from rural and semi urban areas. Therefore, the results should be interpreted with caution where the situation in urban and private institutions may be different. This study has not included teachers' and parents' viewpoints. Therefore, future research should include other stakeholders, for example, teachers, principals, and parents. Longitudinal qualitative research and experimental research can examine the effectiveness of supervised and unsupervised mobile learning in this context in future.

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References

- Adhikari, P. (2015, December, 27). TU to deliver higher education via online. *The Gorkha Patra*, p. 3.
- Ally, M. (2009). *Mobile learning: Transforming the delivery of education and training*. Athabasca: AU Press. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.475.2163&rep=rep1&type=pdf>
- Bishowkarma, B. (2007). Mobile in the class. *Sikshak*, 3(36), 18–22.
- Central Bureau of Statistics (2012). *Brief census report, Kathmandu*. CBS.
- Hayati, A., Jalilifar A., & Mashhadi, A. (2013). Using short message service (SMS) to teach English idioms to EFL students. *British Journal of Educational Technology*, 44(1), 66–81. <http://dx.doi.org/10.1111/j.1467-8535.2011.01260.x>
- Higher Secondary Education Board (2013). Students' code of conduct. Kathmandu.
- Kumar, A., Tewari, A. Shroff, G., Chittamuru, D., Kam, M. & Canny, J. (2010). An exploratory study of unsupervised mobile learning in rural India. *CHI 2010*. Retrieved from <http://bid.berkeley.edu/files/papers/CHI2010a.pdf>
- Lee, M. J. W. & Chan, A. (2007). Pervasive, lifestyle-integrated mobile learning for distance learners: an analysis and unexpected results from a podcasting study. *Open Learning*, 22(3), 201–218. <http://dx.doi.org/10.1080/02680510701619810>
- Mehdipour, Y. & Zerehkafi, H. (2013). Mobile learning for education: Benefits and challenges. *International Journal of Computational Engineering Research*, 3(6), 93–100. Retrieved from http://www.ijceronline.com/papers/Vol3_issue6/part%203/P03630930100.pdf
- Ministry of Education (2013). *ICT in education: Master plan (2013–2017)*. Kathmandu: Ministry of Education.
- Nepal Telecommunications Authority (March, 2011). *Management information system*, 112(64). Retrieved from <http://www.nta.gov.np/en/mis-reports-en>
- Nepal Telecommunications Authority (May, 2015). *Management information system*, 126(78). Retrieved from <http://www.nta.gov.np/en/mis-reports-en>
- Nepal Telecommunications Authority (December, 2015). *Management information system*, 130(82). Retrieved from <http://www.nta.gov.np/en/mis-reports-en>
- O'Malley, C., Vavoula, G., Glew, J. P., Taylor, J., Sharples, M., Lefrere, P., Lonsdale, P., Naismith, L. & Waycott, J. (2005). *Guidelines for learning/teaching/tutoring in a mobile environment*. Retrieved from http://www.mobilelearn.org/download/results/public_deliverables/MOBIlearn_D4.1_Final.pdf
- ODEC-TU. (2015). *Open and Distance Education Centre in Higher Education*. Retrieved from <http://odectu.edu.np/index.php/introduction/>
- Sharples, M; Taylor, J. & Vavoula, G. (2006). A theory of learning for the mobile age. In R. Andrews & C. Haythornthwaite. *The Sage Handbook of Elearning Research* (pp. 221–247). London: Sage Publications.

- Shohel, M. M. C., & Power, T. (2010). Introducing mobile technology for teaching and learning in Bangladesh: Teachers perspectives. *Open Learning*, 25(3), 201–215. <http://dx.doi.org/10.1080/02680513.2010.511953>
- Shrestha, P. (2011). The potential of mobile technologies for (English) language learning in Nepal. *Journal of NELTA*, 16, 1–2.
- Shrestha, S. (2012, October 16). Learning experiences in the real world: exploring the potential of low-cost open source platforms for mobile learning in Nepal. *Learning Experiences. Run for Nepal*. Retrieved from <http://offlinemobile.blogspot.com/2012/10/learning-experiences-in-real-world.html>
- Terras, M. M., & Ramsay, J. (2012). The five central psychological challenges facing effective mobile learning. *British Journal of Educational Technology*, 43(5), 820–832. <http://dx.doi.org/10.1111/j.1467-8535.2012.01362.x>
- Traxler, J. (2007). Defining, discussing and evaluating mobile learning: The moving finger writes and having writ. *International Review of Research in Open and Distance Learning*, 8(2). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/346/875>
- UNESCO (2015). *UNESCO Mobile learning publication*. Retrieved from <http://www.unesco.org/new/en/unesco/themes/icts/m4ed/mobile-learning-resources/unescomobilelearningseries/>