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# Use of Mobile Application for Communication, Interaction and Learning: Lessons from an Action Research

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## Abstract

*Integration of mobile technologies into training and instruction for learning facilitation is important these days. It is because the users of the mobile devices are increasing as enablers of the learning opportunity anywhere all the times. In addition, learners like to get information, learning resources and activities on their palms via mobile devices. In this context, this paper reports lessons from action research about the use of customized android mobile application at a teacher education institution in Nepal. The research started with the purpose of promoting the use of Mobile App for e-learning that contributes to improving access to e-learning resources and instant communication for course activities. Online survey, informal interaction and interview were used to collect data. Activity theory has been influential to analyse the use of Mobile App for the learning facilitation. The research shows that the course facilitators rarely used Mobile App, instead they liked using web browsers in their large computer screen. However, students used the Mobile App and they wanted the updated version with user-friendly interface. Main lesson from the research is that the roles of institution and facilitators are important to create and provide mobile friendly options of learning facilitation where students themselves can explore in the internet, learn, and use available applications and tools required for their learning. Training institutions can introduce mobile application to bring about a change in the ways of training methods and pedagogical practices with technological interventions. Trainers can consider mobile apps for techno-friendly instructional experiences. Also, learners can access mobile apps for training resources and other learning to enhance their knowledge and skill.*

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**Keywords:** Mobile App, Activity Theory, E-learning Platform, Action Research, Communication, and Interaction, Connectivism

## Introduction

“Mobile devices have become ubiquitous, and both smartphones and tablets offer so many new possibilities for learning” (Aberdour, 2013, p. 1). In

the context of technological evolution, it is important for a teacher to be involved in various research-based practices considering Information and Communication Technology (ICT) as catalyst for

educational innovation. Especially in mobile learning, it brings opportunities like, 'anywhere, anytime' learning, reaches underserved learners, improves the twenty-first century social interaction, fits with learning environments, and enables a personalized learning experience (Shuler, 2009 as cited in Pachler et al., 2010). Reflecting on this fact, I wanted to involve myself in a research to explore the use of mobile application for e-learning at a teacher education institution where teachers have been using web-based platform to deliver their courses since long and teachers are familiar with the use of different web tools for teaching and learning through learning management system (LMS) namely Modular Object-Oriented Dynamic Learning Environment (Moodle). In the institution, use of online resources and activities for teaching and learning has also been increased. However, use of the mobile application was not the formal concern. Therefore, I as a teacher interested in using ICT in education, personally worked to customize the Moodle Mobile App for android devices and placed it in Google play store so that other teachers and students of the institution could download and use.

The mobile application I customized was freely available to download from the Google Play store. However, after a month, I noticed that only thirteen people downloaded the App and was active in four devices. This situation warned me to question on usability of the App. Therefore, I thought to conduct an action research to find out the existing problems and take necessary formative actions. I personally assumed that one of the main reasons for the small number of users might be due to lack of information among the users (students and teachers) about the availability of the apps at the Google play store. I also assumed another reason might be due to the lack of orientation or training to use the App. Hence, I decided to conduct an action research with the purpose of promoting the use of the mobile apps for e-learning at the institution. Promotion of the app was considered as it would contribute to improving access to online learning platform and increase course communication between course facilitators and the

students enrolled in the course. To meet the purpose, the study tried to answer the following questions: 1) Why do students and teachers use e-learning Mobile App very less? 2) How can we promote the use of Mobile App for improved access to online courses and course communications?

E-Learning mobile application was available to promote engaged learning, improved access, and effective communication. Therefore, the research was an action towards maintaining improved access to online courses through mobile pedagogy. As all students and teachers of the institution own a smart hand-held mobile device, both the students and teachers would be benefited directly using the apps in different ways such as course access, synchronous or asynchronous communication, downloading/uploading teaching and learning resources or activities from anywhere anytime. In addition, this action research had been meaningful to find the existing problem and take formative action to introduce mobile learning pedagogy contributing to greater access to e-learning platform and improved communication. Most importantly, students in online or distance learning mode have better option to access online courses (Pangeni, 2016) using the Mobile App.

### **Method of the Study**

Study was conducted in a leading teacher education institution in Nepal. The institution was purposively selected for the study where teachers had been using web-based platform to deliver their courses since long and teachers were familiar with the use of different web tools for teaching and learning through Moodle based LMS. However, mobile app was not formalized as stated in the previous section. Therefore, I customized an app based on the LMS of the institution, placed the app on public repository of Google Paly Store and conducted this study. This study was completed following four steps of actions in a single cycle (plan, act, observe and reflect). Purposively selected teachers and students (who were active in the e-learning system) were involved in the major events of the research such

as survey, interview, training/orientation, research related communication and testing the updated Mobile App. Google survey was distributed to a total of 125 respondents: 24 teachers and 101 students. However, only 10 female and 38 male, total 48 (11 teachers and 37 students) responded to the survey. Then, the focus of the study was placed on those respondents who replied to the survey. In addition to the Google survey, I conducted group discussions with 10 students and personally interviewed 5 teachers. The students and teachers were purposively selected to ensure that they were actively using the LMS. To orient teachers about the App download, install/setup and use, an email with written note was distributed via messaging function embedded into the existing e-learning system. Maintaining the research ethics of confidentiality, name of the institution, teachers and students are not mentioned in this paper. Teachers are represented as T1, T2, T3, etc. and students are represented as S1, S2, S3, etc. The language used for data collection (survey, group discussion and interview) was English as it was the means of communication in the selected institution. Therefore, language used in quotation marks are as it was collected.

### **Data Presentation, Analysis and Findings**

Findings from the initial inquiry (before action intervention) are presented here in different themes and sub themes as emerged from the data obtained through personal interaction and interview with selected research participants. In addition, text and other information received from the survey are also included.

#### **The App was Less Used by Teachers**

T1 lately knew about the e-learning App, he has downloaded but has not gone through the App. Instead, he said, *"I am using e-learning by web"* (T1, Interview). Likewise, T2, T3 and T4 all stated that they know there is a mobile App for e-learning, but they are not using the App. However, all of them agreed that many of their students use the App. On the other hand, T5 said, *"I know, there is a mobile application for e-learning and I am using the App*

*for quick access"* (T5, interview). In addition, one of the students participating in survey said, *"I feel more comfortable working in the computer, typing the assignments and all. The App could come in handy to stay in schedule with due dates and presentation schedules"* (S1, Survey).

Interview data presented above demonstrates that all the teacher participants of this study are aware about the existence of the Mobile App for e-learning. However, only one teacher has been using the App. Survey data including both students and teachers shows that 33.33% of the respondents do not use the App. They have given the following reasons for not using the App (n=16): does not have android phone (4), no one asked them to use the App (9), missed orientation session (6), unable to install the App (2), and unknown about the App location (8). After the survey, for those who answered that they are not using the App, App download URL link was provided and they were requested to download, install, use, and write comments if any along with a brief note, *"If you have an android device (phone or tablet), please go to the following link, download the App, install and use. Also provide your initial comments"* (Note, Survey). In doing so, the concerns presented above would be solved except for the concerns presented in first and forth point.

A teacher highlighted the need for promoting mobile use, *"yes, we must promote Mobile App for e-learning for two reasons a) Timely response on the students' submission, and b) Timely communication/feedback to the students"* (T2, Interview). T2 also stated that he does not know whether students keep the Mobile App in their mobile or not because he has never asked and checked. T1 has been using e-learning via web browsers from a computer but not from a mobile device. But he knows that his students had downloaded the App, participated in communication, and submitted assignment. T4 also prefers using e-learning from his computer not from the mobile devices, *"I don't use the App because I don't need it. I am using e-learning in my computer. I do not have passion to see the small screen of mobile phone.*

*I am comfortable with my 18-inch computer screen”* (T4, Interview). Here, the small screen of mobile phones has been raised as the problem. So, T4 suggested developing a desktop App similar to the mobile App so that it can be viewed in the big screen. However, the problem related to the size of the screen might be a personal preference. Also, it is notable that laptops and desktops are not useful ‘on go’ for instant messaging, calendar view, and notifications.

T5 who mostly use the App said, *“I downloaded the App and currently using it to keep track of my student’s assignments, view information, notices, and courses; note what has been done by student* (Interview). T5 also prefers uploading resources and downloading assignments on his laptop or desktop. He uses the Mobile App for instant messaging and to give notification about student’s submission and due dates of assignments.

From the above data presentation and interpretation, Mobile App is mostly used for instant messaging and notification instead of handling heavy works such as downloading and uploading resources and activities. Also, the screen size matters to view things comfortably.

### **Difficulties of Using the App**

Difficulties/Challenges of using the App have been expressed in unusual ways by the teachers. A professor compared his own limitation and the limitation of mobile device and concluded, *“I rejected in initial time to apply Moodle. That time, I thought it is my weakness but now I understand such psychology that it is not my weakness it is the generation’s weakness”* (T1, Interview). He was indicating to the new generation that are friendly with the internet technology. Likewise, T2 does not use the App because he possesses classical version of the mobile device that does not support the App. However, sometimes, he uses an i-pad which does not support android application.

T3 also does not use the App because of the limited functionalities in his device. He owns two devices;

one is small with limited functionality and the other is a tablet which is rather big and difficult to carry. He also said, *“those who have small mobile phone feels uncomfortable to read the text, so videos and audios are suitable for all”* (T3, Interview). However, most of the course resources currently provided via e-learning platform are text based. The major problem indicated here is the small screen of the mobile handsets.

### **Opportunities of the App Use**

Despite few challenges/problems as presented in the previous section, teachers agreed that the e-learning App is especially useful to them. Justifying the usefulness of the App, T1 said, *“we have got a chance to be in touch with the course from anywhere. It helps us to be updated with the modern technology related to our profession”* (Interview). He further added that mobile technology is really an innovation for allowing greater intensity of interaction with the content and the students. Likewise, one of the students responding to the survey said, *“App is especially useful to make us alert with notifications about course activities, deadlines, submission, messaging and feedback from teachers. It also helps us to get in touch of learning technologies”* (Survey response). Although T3 does not use the App, he encourages his students to use it. He highlighted the benefit of the mobiles stating that students can use earphone and listen to the uploaded audio and video-based learning materials even while travelling by bus. In addition, it is also possible to change the text into speech and listen, *“In my view if we upload audio and video of classroom teaching activities it will be helpful for those students who cannot attend their classes”* (T3, Interview). At this point, it is important to note that audio/video materials would be better than text for the use of mobile Apps.

Research interaction with T4 has provided an unique insights that there are different people with different interest, and students from remote places have problems to use computer and laptop, so they feel text are easy for their mobile that are connected to the Internet with GSM data. However, T4 said, *“for*



a person like me who uses 24/7 high bandwidth Internet via cable or Wi-Fi, desktop or laptop is comfortable. In this case Mobile App may not be necessary" (Interview). From the statements of T4, connectivity concern and comfort of device use is noticed. In the remote places, mobile is preferred for GSM data use and in the urban cities, high speed wired or Wi-Fi Internet is available so desktop or laptop computers are preferable.

Arguments of T5 demonstrate more benefits of the App uses. He pointed out three major benefits: 1) mobile is preferred as its use is ubiquitous; 2) Mobile App is good for instant notification on assignment submission and messages from students; and 3) official notices or course communication becomes quicker from Mobile App use. All three points are useful however, T5 has not been using the App for uploading resources, grading, and making interactive learning activities. I personally noticed that the Mobile App does not provide robust tools for teachers as compared to the use of LMS site in desktop or laptop computers.

### **Suggested Ways Forward**

As experienced by T1, the generation who think of mobile only as a toy are now in college and school level. They are not in post graduate level. It means we still do not have technology savvy students in our Master's degree programs. Therefore, T1, recommended conducting mobile orientation, entertaining activities to use Mobile App with technical support. He, further stated, "*people reject using Moodle if the use is not entertaining and user-friendly*" (T1, Interview). This statement points out to the need of user-friendly design of the application and its usability to motivating through entertainment. E-learning also has been considered as an additional work load for faculties. In this regard, T2 said, "*in online, face-to-face and many other programmes we are busy. So, workload division is important*" (Interview). Showing his own desktop computer, T2 further said that he was responding to more than thirty emails a day. It was an indication of his busy schedule and time management to be considered as

an important aspect. Taking work with e-learning as an added workload, he further stressed on the need of prioritization, "*we must think which work is of priority, how much time should be given to which work and why should we give priority. In this case our online learning/e-learning is not given priority*" (T2, Interview). T2 further argued about the need of mobile application to be customized for desktop to maintain uniformity in usages with different devices.

Talking about the use of mobile application, T3 pointed to the need of App friendly resources and activities. After making the App friendly materials, students need to be encouraged to download and use the App. In relation to the promotion of the mobile application, T5 suggested to make a compulsory reflection/discussion hour within every class and request students to write reflection of the day about the use of mobile devices for learning. For example, if class ends by 7:30PM then, the teachers should conclude the class by 7:10PM and allow 20 minutes for students to write the reflection of the class via their mobile phone. However, high speed internet is required in each class for such activities. According to T5, the activity has two sided benefits: first, students learn to summarize their understanding through daily reflection, and second, they use mobile application. Teachers can also instantly check submission, write comments, and provide feedback.

### **Analysis of Survey Responses**

The responses from the participants who are using the App had been the important concern. Those who are not using Mobile App among 48 respondents are also valued and their concerns are analysed. One of the essential information about the App use has been the respondents' ownership of mobile devices by its type (Smart/General). In this regard, survey with n=48 shows, 93.8% are using smart mobile devices and 6.2% are using general mobile devices. Likewise, another concern of the survey was on the responses from the respondents who used and who did not use the mobile application. In response to this concern, 66.7% respondents reported that they are using the App and 33.3% responded that they are not using

the App.

The survey had a multiple response set of questions on the purpose of the App use (n=32). The primary purpose of the App use was to view course (94%), view notifications (84%), and submit assignment (72%). The purpose of the App use for communication was very low (9%). Likewise, contact list management and communication (13%). Other purposes of the App use were to: view site news (63%), download course for offline use (50%), view the assignment due date (66%), mark the calendar event (66%), view grades (66%), and upload the private files (41%).

In an open question, “*Please write down the comments about the use of the App (pros and cons)*”, survey respondents replied as follows: 1) **Advantages:** Best to find all aspects in a single App, friendly to use, makes whole course downloadable, easy for offline use, useful and applicable for anytime/anywhere users, easy to learn about course and other information, professional and keeping users in touch about course and notification, saves time, fruitful to use course material without searching in vast Google, informative and detail provider, promotes ICT skills, an innovation for allowing greater intensity of interaction with the content and the students, quickly accessible, handy use in mobile, better opportunities to be intact with course and assignment deadlines. 2) **Disadvantages:** Time taking to first load, some functions do not work offline, hard for novice user, difficult to be familiar with the study materials in the App, course view is mess and inconvenient, sometimes App does not respond, servers are frequently down causing problems, better only for reading not for submission and other activities.

There are more advantages than the disadvantages. Main recommendation is about the mobile App update with new features. It means when more new features are added with App updates, most of the disadvantages would automatically be addressed. Likewise, upgrade of Moodle system would also help to maintain stable service of e-learning.

## **Interventions**

After analysing the survey and interview data obtained from initial inquiry, the following actions were carried out:

## **LMS Upgrade**

Students and teachers pointed out the need to update the LMS system. Therefore, as part of the intervention, outdated version of the LMS 2.9 was replaced by the latest version 3.5 and made necessary update of the Mobile App options into the web App of the LMS. The outdated version 2.9 had limited features and was not compatible to the mobile application. Latest version was available with new features related to the mobile application. Using the new features such as mobile settings, mobile authentication, mobile appearance and mobile features, admin can customize the official Moodle Mobile App too.

Features in the latest version of LMS for mobile settings are useful to provide customized tools directly from the web to add user-friendliness. Changes made in LMS do not require local update of the App. For example, if custom menu items are added from the LMS website, these added menu items are seen by the Mobile App users without having to update the Mobile App.

## **Mobile App Update**

Some students and teachers requested to update the Mobile App to make it more user-friendly. The demand of the users was to make the iconic things more visible and directly accessible. Therefore, an attempt was made to update the Mobile App that was initially customized. The App has been updated and made available to download directly from the LMS site. There is a link to download the updated version of mobile application file.

*Home Screen:* In the previous version, course search, course categories, site news and collapse menu icon were hidden. In the latest version, there are many icons on the home screen of the App. Collapse menu has been removed. Icons for home, calendar,

messaging, notification, and many more menu options are labelled at the bottom of the App home windows. Such an appearance makes it easier to access the features in the application. Users need not search for menu items from the collapsed form. They can directly click the icon and use the essential features. Updated App users can now easily find the difference between the old and new App. However, users of the new App need to click the vertical three dots for more menu listing. In new App, home screen has a scrolling option to view the site home, courses, and timeline – displays after pressing arrow (→) sign. In site home there are three main options to search courses, course categories and site news.

*Calendar:* Users can find a calendar icon on the taskbar at the bottom of the App window. This icon was hidden on the menu drawer in the previous version. It must be easy for students now in the latest version as it appears when the users start and load the App home. In the calendar, students can view assignment deadlines, course events and school's activities if that are set by admin. Teachers are also able to view the course calendar and system calendar for activities they have set for students and themselves.

*Notification:* Users can find notification as a bell icon indicating the number of new notifications highlighted. This icon is placed on the taskbar at the bottom of the App's home window. This icon was hidden on the menu drawer in the previous version. Now, it must be easy for students in the latest version as it appears when users start and load the App home. In the notification, students get notification of new assignments, deadlines of assignments and all other course activities, grade, and feedback. Teachers get information about student's submission of activities. Students are also notified about all course updates via notification. Site news, forum update or post, message from teachers or admin etc.

*Messaging:* This is an option for the App users to interact with each other in online or offline setting. Such interaction may also take place as real-time chatting. It can also be used as private communication

tool between users. Using the messaging tool, App users can create list of contact and initiate communication. One to one and one to many communications between users are allowed by the system. App users can be searched for communication if they are registered in the same course. To start messaging, its icon placed on taskbar at the bottom of the App window can be pressed. This icon was hidden in the drawable menu in the previous version of the App. As it is brought in the front, it must be easy for users to use the tool in the latest version directly from the App home. In the messaging, students, teachers, or admin can send offline messages to each other. If they find someone online, they may hold real time chat. However, such chat would be text based. Messaging tool is linked to notification for new message alert via the notification area. Users can see notification on their mobile screen and press view to read the message. Notification setting must be localized before using the tool in customized form – type of alerts (ring, vibration, silent), types of message (course update, assignments, calendar activities, or message).

*Courses:* In this menu, users can find the list of enrolled courses. If they want to view other courses, they must go to the course categories or search courses with short name or any word that matches to the title of the course. However, users can not view the course if they are not enrolled in. Courses can be downloaded for offline use. The downloaded courses will consume storage of the mobile device. In this option, students can view section wise course contents, course summary, and download sections or whole course. Icons and appearances are arranged to make user friendly navigation. Users of the App can find courses by scrolling the tab where the home icon on taskbar at the bottom of the App window. Navigation to enrolled courses was hidden on drawable menu in the previous version of the App. Now, after the update, it must be easy for users as it appears at the front of the App home. Navigating to the courses, users can find, contents, participants, and grades, competencies, and notes. These items are arranged on the header scrolling menu signed

with arrow. After selecting a course, users can go into the course section to view content where all reading resources and learning activities can be viewed, downloaded, and uploaded.

*More Menu:* In addition to the directly accessible menu items, there are more menu items under the vertical three dots. Users can find more menu icon on taskbar at the bottom of the App window. There was no such menu icon in the previous version. This has made it easier for the users to access additional menu items and options while using the App. Underlying menu items within the more menu are user picture and name which can be clicked to access user's profile in detail. Likewise, grades, my files, and other menus customized via web App are available here. Log out option is also placed here. Users can change their profile picture here. Course wise gradebook access would be displayed if the menu "Grades" is selected. In this display, e learning admins may add as many menu items as they like from the Moodle server admin.

Finally, the mobile App user manual was also developed to guide users to follow the process of using various functionality with illustrative examples presented with screenshots.

### **Testing App Functionalities**

After updating the App, two students and a teacher (users of the old App) were requested to test the functionalities of the new App. The request was sent by messages via e-learning site and personal email. Summary of the data received from the App testers is presented here: easy to browse course content even if there is no internet connection; easy to get quick message and instant notifications for deadlines and calendar events; good to find friends quickly and contact them for communication in course related matters; useful to upload different kinds of files from mobile device; supportive to track progress in enrolled courses, mark completed activities and search for learning plans; quiz attempts, wiki editing, and forum post are easy; good for students to view their grades and stay update; offline learning experience is

enhanced; navigation and user interface is friendly to explore things in small mobile devices too; performance is improved; and the best thing in new App is group messaging and messaging control.

### **Discussions and reflection**

It is true that the "use of ICT in education has brought new possibilities for learning online" (Pangeni 2020, p.26). The online learning platforms are responsive to the mobile devices for ease of access and use. Mobile learning provides opportunity to connect learners through "engaged, collaborative, distributive, integrated, and evaluative models, all of which combine to produce a profoundly connected learning experience" (Rankin, 2009 as cited in Hamm, Drysdale, & Moore, 2014, p. 6-7). Discussion here is based on literature and theory on mobile use for learning. In addition, personal reflections are also included.

### **Use of Mobile for Learning**

These days, all learners coming to higher education and training possess mobile phone and they can use the device to collect photographs, video, and audio where appropriate for field visit and other use in study (Borchert & Slator, 2014). Likewise, Students and other people want to perform work, study, and play all times and everywhere. Such reality has been transforming the ways of education resulting in the 21st century pedagogy for mobile based learning (Hamm et al., 2014). These authors also suggest that higher education institutions require to follow a definition of mobile learning that enhances institutional strategies to integrate mobile learning technology in practice. Thus, using the Internet connected desktops computers at learning centres and personal mobile devices such as tablet, laptop, and smart phones, students and teachers get plenty of teaching and learning resources through online platform. Physically, such facilitation is hard because of limitation of physical libraries. Especially, mobile learning is an opportunity that allows accessing multiple e-content format such as audio, picture, text, video, etc.) any time, any place (Bejjar & Boujelbene, 2014). Yet, in the context of my current



study, it is necessary to develop appropriate guidelines or orientation for both the teachers and students about the use of mobile phone for learning and teaching.

Therefore, it is essential to know how teachers or institutions can assure the use of mobile apps for various academic uses. For example, mobile use for access to other learners, systems, and devices can help recognize and evaluate information and process the information to achieve their learning goals. Most importantly, use of the mobile application allows ease of access to e-learning an alternative method to pursue education and continue learning even in the unusual times like COVID-19 pandemic (Pangei & Karki, 2021).

### **Mobile Apps for Course Communications**

Along with the development in ICT, mobile devices including Tablet PC and smart mobile phone sets have been handy tools for instant communication. Improvements in telecommunications networks, the decreasing cost of access and the ubiquity of mobile phones as potential tools for mobile learning represent areas for further development in online, blended, and mobile learning as tools of teacher education (Mâta, 2014). On the other hand, “mobile learning is one reflection of the ways in which emerging technologies have become an ambient expression of technology in the ethos of our lives” (Hamm et al., 2014, p. 15). Therefore, these days all web platforms are responsive to mobile devices. There is an official mobile application available for Moodle users too. Student with any kinds of smart phone can download and install those apps from concerned application store. After installation of the software, teachers and students can access their courses using their login credentials and universal resource locator (URL) of their institutional learning platform based on Moodle.

### **Theoretical Bases for Learning with Mobile App**

Learning context with Mobile App is technologically mediated. To analyse learning situation in the context of technology, connectivism has been proposed by

Siemens (2004) and Downes (2005). The theory describes how learning takes place in digital age and guides the process of material development for instruction in networked world based on the contribution of modern technologies. Information in the networked world through the Internet is complex and the growth of web technologies is exponential. Therefore, connectivism is proposed theory as "a learning theory for digital age" (Siemens, 2005). Essence of the theory of connectivism lies on need of instructional design that focuses on creating interaction in between human and machine. The theory has a principle that desires nurturing and maintaining connections for facilitating continuous learning. In this study, the theory was applied to see whether mobile app helps teachers and students in maintaining the connection for continuous learning. As the app used in the study provides tools for human-machine interaction leading to meaningful learning, the essence of connectivism is well reflected through app-based design of learning facilitation. When peers of learners are connected and share opinions, they learn through collaborative process (Siemens, 2004). This is possible in the context of mobile app use as it has discussion forum and chat like tools to bring learners together.

Likewise, activity theory is also preferred as an appropriate theory to evaluate, analyse, and explain technology mediated learning. “Activity theory can be applied to settings involving the use of technology in higher education” (Scanlon & Issroff, 2005, p. 433). According to the theory, in this study, subject (student) in pursuit of achieving object (task for learning), manipulated tools (mobile App) following the rules (proper actions) set for the community (among students and teachers) with appropriate division of labour (instruction for learning) (Blunden, 2012). Thus, the result of activity has been the outcomes (engaged learning) or satisfaction of the subject (student). When we view the context of Mobile App use for learning from the perspectives of the activity theory, we see students as subject who manipulate the options in the Mobile App as tools for defined task of learning following the guidelines

set for students where teachers define tasks as instruction. As presented in the analysis of survey above, the feedback/comments received from students on advantages and disadvantages of the App use can be considered as the result of the whole process. This is how proposition of the activity theory is aligned to this study.

### **Personal Reflection**

Mobile learning is emerging as an alternative to traditional classroom-based education. Internet based mobile learning is one of the new educational dimensions where “the Internet offers resources for learning anytime/anywhere, which allows extensive flexibility in learning processes” (Goktas & Demirel, 2012, p.908). Thus, the use of Mobile application in education provides flexibility in learning. Being a teacher in online era of education, I have learnt to customize the open-source App to address local needs of users. It is important because global user interface does not include user facilities for local use. This research has been important to know about the interest of students and teachers in using technological tools and software interface for greater learning outcome and higher motivation. For example, students wanted frequent updates of course platform and they also wanted the navigation panel on the home page of the App interface. Students are happy to use Mobile App for instant communication and course view. For students, App provides time saving option to access the course readings, activities, and calendar events. Notification alarm on mobile allows students to be alert all the time. However, most of the teachers' choices are old-fashioned as they prefer big screen on their desktop.

In this study, when I see communication, interaction and learning from the perspectives of connectivism, Mobile App enables networked learning and learning through human-machine interaction (Siemens, 2005). Likewise, from the perspective of activity theory, students as subject manipulate mobile App – the tool, to accomplish learning tasks – the object. In this process, authentic instructions are followed as rule of actions dividing roles among the members

of the community. This is all about relationship between subject, activity, and object (Blunden, 2012). The result is interactive and engaged learning that satisfies the subject/student.

### **Conclusion**

Mobile phone has been the dominant means for internet access for learning among the students involved in education and training. In this context, customized Mobile App facilitates learners and facilitators in accessing e-learning, using learning resources and taking part in various course-based activities. Mobile Apps are useful for prompt communication and support. However, success of App use depends on facilitators' active roles in technological facilitation for learning. If teachers are not active in updating their online course portals, students would be frustrated. Customization is useful for contextual use of open-source software tools from the perspectives of user interface, navigation menus and language.

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