

Mobile Learning Experiences in the Philippine Education Setting Using Portable Moodle

Dave E. Marcial¹

¹College of Computer Studies, Silliman University, Dumaguete City, Negros Oriental, Philippines
Email address: ¹demarcial[AT]su.edu.ph

Abstract— In an attempt to achieve innovative teaching and learning in provinces where an Internet connection is a challenge, a USB-based portable learning management system was developed. This paper is aimed at describing the experiences in implementing a USB-based learning management system in teacher education in the Philippines. Specifically, this article presents Silliman University's experiences in customizing a tool for innovative teaching and learning in teacher education. It describes the result of the pilot implementation of the tool among the select higher education institutions in Central Visayas, Philippines. This paper also presents the reflection and lessons learned by the teacher educators and students in the learning management system. The learning management system was customized using POODLE, a portable MOODLE. It can run on a USB flash drive without an internet connection. A total of 16 trained teacher educators in Central Visayas, Philippines were selected as pilot-teachers. The study reveals that the implementation varies among the pilot-teachers in terms of level, mode, and terminal usage which are all affected by many variables. It was discovered that there are more facilitating factors than hindering factors in implementing POODLE for mobile learning. The study found out that POODLE is a useful tool for mobile learning in areas where internet connection is limited.

Keywords—Technology, e-learning, ICT in Education, mobile learning, POODLE.

I. INTRODUCTION

Information and communication technology (ICT) changes the way teachers teach, and the students learn. Generally, it provides positive pedagogical impacts. It also augments aspects of education such as assessment, organization and management, operations, professional development and many more. Among the many advances in ICT in education is the emergence of mobile learning. Mobile learning revolutionized the traditional way of classroom learning [1] both formal and informal contexts [2]. Mobile learning is defined as “any type of learning that takes place in learning environments and spaces that take account of the mobility of learners, learning, and technology” [3]. Mobile learning is viewed positively by students in terms of accessing information quickly, communicating and collaborating, introducing a variety of ways to learn, and situated learning like game-based learning [4]. Students in higher education have a high level of personal innovation and mobile readiness [5]. Mobile learning requires a technology that can build and deploy applications. Mobile technologies refer to a combination of hardware, operating systems, networking, and software, including content, learning platforms, and applications. Mobile technology devices range from basic mobile phones to tablet PCs and include PDAs, MP3 players, memory sticks, e-readers, and smartphones [6]. Among the many mobile learning tools are learning management systems. A learning management system (LMS) “is a software application for the administration, documentation, tracking, reporting, and delivery of educational courses or training programs” [7].

There are many ways that LMS can be implemented. First, LMS can be implemented within a school or organization through a Local Area Network. Teachers and students can access their learning management system only within their campus. It needs enough computer terminals within the

campus to provide accessibility to the students. It also requires investment in terms of the local area network implementation. Second, like in many prominent universities, LMS can be implemented using Wide Area Network. It means that teachers and students can access their learning management system anywhere and anytime. A school needs a reliable internet connection for this kind of implementation. This is one immediate limitation in any LMS implementation where it created issues in the accessibility and utilization [8], [9]. A reliable internet connection is a must in this kind of implementation. Another kind of LMS implementation is the portable version. “A portable LMS is a content management system that is transferable to multiple environments and manageable to a variety of infrastructure specifications [9]. While it is true that there are many offline or portable versions of LMS, schools are challenged in terms of costing and pricing especially for proprietary software licenses. On the other hand, implementation of open source LMS requires experts that many of the schools do not have.

To offer innovative teaching and learning in higher education institutions in the Philippines, a portable learning management system was customized using Poodle. Poodle is a portable version of Moodle. It mounts Moodle on portable drives such as USB sticks, memory cards, HDDs, among others and it is built on the popular PortableApps platform. The customized portable LMS is called PLMS, a handy learning management system that can run on USB flash drives [10]. The development of the learning management system was funded by the Philippine Commission in Higher Education through the Philippine Higher Education Research Network.

A learning management system is “comprehensive, integrated software that supports the development, delivery, assessment, and administration of courses in traditional face-to-face, blended, or online learning environments” [11]. In a

learning management system, teachers can manage classroom activities such as test and assignment administration, student performance tracking, record-keeping, among others. Teachers can also manage classroom resources such as posting announcements, learning handouts in different formats, among others. Most importantly, “LMS allows users to access content day or night, from virtually any device, from anywhere with an internet connection” [12]. “An LMS is a software tool designed to manage student interventions and hence provide access to online learning opportunities for both students and teachers” [13]. Some related applications include mEKP and Atum-KFP, cited in [10]. Other offline LMS in the market includes those offered by BlueApple (www.BlueApple.com, n.d.), Paradiso Solutions (www.paradisosolutions.com).

Given this, the purpose of the article is to describe the experiences in implementing a USB-based learning management system in teacher education in the Philippines. Specifically, this article presents Silliman University’s experiences in customizing a tool for innovative teaching and learning in teacher education. It describes the result of the pilot implementation of the tool among the select higher education institutions in Central Visayas, Philippines. This paper also presents the reflection and lessons learned by the teacher educators and students in the learning management system.

II. RESULTS AND DISCUSSION

A. Experiences in Developing PLMS

The development of PLMS employed a customized software development model where it combines traditional and non-traditional development model. Precisely, it consists of five major phases; these are user requirements analysis, customization and coding, system testing, training and quality testing, and delivery and dissemination [10]. The system quality was tested empirically among teachers in higher education institutions, and it garnered a high level [11]. PLMS organizes classroom information and learning activities, even without Internet connectivity. Like many other learning management systems offline, can unify and automate administration, use self-service and self-guided services, format and deliver learning content offline, support portability and standards, and personalize content and enable knowledge reuse for teachers. In terms of pedagogical integration, PLMS was designed using pedagogical principles embedded in Moodle, to assist teachers to experience innovative teaching and learning practices. On the other hand, it was found out that PLMS is susceptible to virus attacks that need proper handling among the users due to its portability.

B. Teacher’s Reflection and Lessons Learned

A one-day learning workshop was conducted, and it was participated by 16 teacher educators in higher education institutions in the Philippines [15]. These teachers had undergone several capability training on the classroom use and integration of PLMS. One of the objectives of the said learning workshop is to document the outputs of activities done and the reasons why the teachers from November 2015 did not do some activities to March 2016. They had their

action plan and preliminary forms as bases of their answers. The participants were asked to write their answers. The participants were divided into three groups, and a volunteer was requested to report their reflections.

Teacher 1: For her PLMS review of experience, the first presenter has added a course (Multimedia) which she has started during the train-the-trainers workshop. Unfortunately, she could only enroll two students because, in a class of 40 students, only 15 have flash drives, so she stopped enrolling students to give those who cannot afford it yet some time to produce one. It was only in the final term that she was able to start the implementation of PLMS. Just when she was in her initial phases of implementation, her files got corrupted; thus, she had to start from the beginning, even downloading a new set of PLMS from the website. However, she again had issues with flash drive swaps among students, with some claiming they lost what they have passed to the teacher. She thought of a way to give a solution to the problem. They developed a file manager network system for PLMS. It is worth noting that in portable management systems, going online is a common consideration, making the flash drive only a strategy of transferring files, not making the USB as the working platform of the system.

Teacher 2: The second presenter said that though she has no IT background, she is teaching Educational Technology in her school. In November, she created what she had placed in her action plan, class activities on PLMS. By December, she already added lessons and quizzes in her PLMS. She was initially set to introduce it to one class only, but through students’ word of mouth, the other classes were asking her also to implement it in their classes, thus having six classes in total using PLMS with 300 flash drives to check if everyone would pass; quite a challenge, indeed, in the part of the teacher. By January, only 100 submitted their flash drives. By then, some students returned their flash drives to the teacher because of file corruption. She continued by explaining that the main hindering factor of the implementation is the students’ inability to acquire the gadgets: flash drives and computers. As her foundation and accomplishment, she was able to conduct a semestral talk/seminar on the said tool. It eventually became an information drive on the tools to her colleagues and even to the siblings of her students who were interested. She ended her presentation with a message: “in planting something, it should be cultivated with different virtues such as patience and other positive energies to [attain] this beautiful output...a flower in adversity.” It can be noted that in technology, guidance, and cultivation and is necessary.

Teacher 3: The third presenter started by admittedly saying that he is part of the 80% who was not able to integrate the digital tool in the classroom, especially PLMS. He further explained that the school prioritized the promotion and marketing of their K-12 offering such that extra effort was made because the school is in a remote area and him being the chairman of Science and Mathematics had to be involved with it. That was the main reason why he was not able to formally introduce the two apps to the school; instead, he introduced them to colleagues during informal chats with them. He got some feedback from colleagues who used the tool. A student

teacher who said that they did not have problems using it, but they have recommendations. For PLMS, he planned to use it after midterms, to his K-line scholars of BS Marine Transportation, but he failed since the students' schedules are too structured for him to insert activities other than what is prescribed. Also, the school's computer subjects are offered in the second semester, making the computer lab in use for classes 8 hours a day. On his own, he worked on his lessons on PLMS and even managed to make a quiz. However, experimenting with file transfers between laptops, he also experienced file corruption. Another teacher from the same school was able to implement PLMS using flash drives. She was able to retrieve some outputs from her students, but she also encountered the same problem of file corruption with some. "PLMS must have been a good tool, only that file corruption is a hindrance that we encounter," he said.

The second workshop is the force field analysis wherein they were grouped into two. They were to list down the facilitating as well as the hindering factors of the digital learning tool, and they have to rank these factors. A presenter in each group was requested to report their output.

Group 1: The first group ranked portability as the first facilitating factor. It was explained that there is ease of use. He further explained their third facilitating factor, which is the apps being innovative tools. He said that "we are here in the twenty-first century, teaching [students] to be innovative. The tool introduced to us are a great help to teachers in becoming innovative, too." The group's next facilitating factor is scalability. It was explained, "scalability is the mechanism of the system to handle files." She cited that in PLMS, initially, she thought that the bigger and the more files uploaded, the slower the PLMS will work. She realized that it was the virus and file corruption that was more of the problem over the system being slow due to file overload. She said that even if she had uploaded many files, the system was okay at the time when it was not attacked by the virus yet. This made her conclude that PLMS can "handle the bulk of file which is inside the system," meaning the uploaded files. However, with the presence of the virus, even if she had re-installed PLMS anew, it easily resulted to file error. It was further explained the next facilitating factor, which is reliability. The group ranked efficiency as the next facilitating factor saying that everybody would agree that PLMS is efficient. The seventh in rank is "clear & understandable"; he said that what to input on the two apps is clear and understandable, meaning that a user can follow or use the app because it is clear and understandable. He added that his students were able to adjust to PLMS in no time, which indicates that instructions for both apps are clear and understandable. The next facilitating factor in rank was commitment and dedication. For him, teaching with innovative tools adds the teacher's commitment to his/her job, especially in the eyes of the students. It takes great effort and dedication to commit to learning something to enhance one's teaching. In his part, it took him hours in the internet café to practice using the app and to check his students' output. Seeing that his students are proud of this high-tech tool used in their class, it came to him as a challenge to keep up with the commitment and dedication since he does not want to

disappoint his students. He proceeded with the next facilitating factor, which is the tools being a "positive idea" and the next which is admin support. He said that the implementation of the tools is dependent on the support the teacher would get from his/her head. The group also explained the added facilitating factor—which is in the same rank as scalability—data retrieval.

Group 1 found five hindering factors of the learning system, and it starts with file corruption. The presenter understood that portable apps are susceptible to viruses, and PLMS is no exempted. In his part, he had to negotiate with the school's IT support to freeze all drives, such that students cannot use them for data transfer; he is hopeful that he can use PLMS through the computer lab of his school starting this summer. The second hindering factor is poor flexibility. The third hindering factor was "virus scanning/cleaning takes time." The issue of students not backing up files was also mentioned. He advised his students to save two to three backups and better still, send it through email, in case of inevitable virus cleaning. The fourth hindering factor is how "copying PLMS to flash drives takes time."

Group 2: The presenter started by mentioning that the learning tool is portable (first in rank) and that they are usable (second in rank). She explained that there are other factors under usability; it is usable when it is effective ("it does what it is intended to do"), efficient when it could save the user's time, and easy to use. The third facilitating factor is that it is paperless, and the fourth is the availability of technology. The fifth one is "ease of file export" to Excel and the like. The sixth is independent learning, in which PLMS facilitated.

The group's number 1 hindering factor is time constraints. Teachers have other teaching priorities. In her part, she cannot impose her students to buy flash drives, so she asked their IT head if she can place it in the server, but she was denied due to the server's storage support. By January, she was informed that she could use the server for PLMS; unfortunately, she was already caught up with other priorities to integrate it in her class. The second hindering factor is lack of technological support, especially on the part of students to be imposed on buying flash drives. The next hindering factor is "clash with school policies." The fourth factor is lack of support from administration, and the fifth is that it is a complicated process. Their last hindering factor is the non-applicability of PLMS to other subjects. She gave as an example her groupmate who teaches Physics which is more on simulation, so maybe he will have more of animation file uploads, which again goes back to time constraints.

C. The Pilot Classes

The use of PLMS was formally piloted in three different classes from three selected higher education institutions in the Philippines during the second semester of the school year 2015-2016. The succeeding section describes the pilot classes.

School 1: A Private School in Bohol Province

Course Title: Principles of Teaching 2 (PT2)

Course Description: The course intends to equip prospective teachers with Principles and Strategies of Teaching, and align teacher education with the CHED-

prescribed new teacher education curriculum that is reflective of the National Competency-Based Teacher Standards with the end view of contributing to the formation of the ideal professional teachers as concretely described in the seven integrated domains of the teaching and learning process. The activities or exercises at the end of every lesson are intended not only for drill and evaluative purposes but also for purposes of advocacy for current trends in education such as reflective education, multiple intelligences, multicultural education, interactive and brain-based teaching, authentic assessment and of bridging the gap between theory and practice. It also exposes prospective teachers to a repertoire of strategies which will provide them opportunities to experience planning and implementing lessons.

Course Objectives: At the end of the term, the students should have: 1) analyzed the goals/expectations and content of a specific subject area, 2) cited applications of the principles of teaching and learning in different subject areas, 3) evaluated the lesson plans in terms of integration, collaboration, contextualization, interactiveness, 4) described various integrative modes of teaching, and 5) described ways to plan, select, and use instructional media

The Student-users: This course is attended by mostly second-year regular Bachelor in Elementary Education (BEED) and Bachelor of Secondary Education (BSEd) students with some irregular third, fourth and all qualifying students. There are 48 students in this lecture course, and about one-fourth of them are married. About one-fourth of these students own laptop or desktop computers. They mainly depend on the Internet Cafes in performing their PLMS activities and quizzes since the school has no operational computer laboratory.

Description of PLMS Integration: Majority of the activities in PT2 are found in the PLMS. Students are provided with resources using “add a File, Folder, and add a Page” for easy access to references such as pdf, doc, xls, etc. The activities given to the students are quizzes, forum and assignments like “Online text,” “Upload a single file,” and instructions for “Offline activity.” The teacher prepares the entire syllabus in the PLMS for the whole semester in a weekly manner and distributes to the students USB flash drives in a full mode of integration. Students will answer all the activities and quizzes in the weekly timetable and submit each USB only after the midterm and final periods – a bi-periodic mode of integration. Aside from the discussion during the class, students can also learn the lessons in PT2 by working in the PLMS on their computer or the computer shops anytime and anywhere at their convenience.

School 2: A Campus of a State University in Negros Oriental

Course Title: Specialization 6 –World History and Civilization 2.

Course Description: This course deals with the study of historical events and people that shape global scenarios starting from the Industrial Revolution up to the contemporary times.

Course Objectives: The course aims to provide the students with the background of global happenings and people

at work that change the political, social and economic landscapes of the world.

The Student-Users: The students who took this course were the 34 BSED II and 3 BSED III major in Social Studies. Altogether, there were 37 students in the class. The course is a lecture class.

Description of PLMS Integration: The teacher made use of learning resources downloaded from the internet to supplement the topics covered for each week. Mostly the files were powerpoint slides. The students much preferred Powerpoint presentations because these are easy to understand and visually attractive. The activities in the course are quizzes, online text, uploading a file, uploading of pictures, writing of reaction papers, essay, and research work. The teacher chose periodic integration of PLMS. She prepared the contents and activities of the PLMS. Each student submitted their USB for file copying of the PLMS. This activity was done during the Pre-Final period or a month before the Final Examination. The students went through the supplementary materials inside the PLMS as well as answered the activities. This process was also timely since during this period the teacher was not able to meet the class regularly due to her hectic schedule of the Final Demonstration Teaching of Practice teachers in the different laboratory schools. In the absence of the teacher, the students answered and performed the activities inside the PLMS.

The PLMS was collected during the Final Examination week for checking and feedbacking. In terms of terminal integration, the freestyle approach was used. The students worked on their own and managed their learning through the PLMS inside their USBs either at home or inside internet shops. To assist the students who do not have their computers or laptop and to those who have no money to go inside internet shops, the teacher provided a desktop computer inside the classroom for the students to use. The student took turns in using the computer inside the classroom during their free time or during their schedule in Spec. 6.

School 3: A Campus of a State University in Negros Oriental

Course Title: Introduction to Stylistics

Course Description: Introduction to Stylistics is one of the specialization courses offered to students taking up Bachelor of Secondary Education major in English (BSED Eng). Graduates of this course are expected to look at the language of texts and the beauty and power of language to create meaning, style, and effect. The fundamental philosophy of the subject is that students are taught a set of analytical tools to be used to examine texts, e.g., words, sounds, structures, or interactive aspects, and that students are encouraged to use the tools on texts so that they will learn by doing or bridge the gap between theory and application.

Course Objectives: In accordance with the national goal of ensuring sustainable growth and stability, promoting full, decent, and productive employment, and in consonance with the University's vision, at the end of this course the Bachelor of Secondary Education major in English are expected to: 1) define key concepts in stylistics; 2) differentiate styles; 3) explain linguistic patterns used as devices; 4) apply critical

thinking through text analysis to hone interpretative accuracy and scope when reading literature; and 5) exercise creativity through through composition of various texts with the use of stylistic principles and devices.

The Student-Users: The students who took this course were 49 BSED students major in English. The course is a lecture class.

Description of PLMS Integration: The PLMS served as a resource and activity management tool. As a resource repository of files, the PLMS utilizes learning resources in pdf, doc, xls, and image formats. The teacher prepares and distributes PLMS for a particular purpose. The PLMS was used in conducting exams, practice testing for board review, reading purposes, or any other precise purpose. The teacher collects PLMS at a specified date and review student's PLMS for grading or monitoring purposes. Because the class is a lecture type, students managed his/her PLMS to any computer on campus, at home, or in computer shops through a USB flash drive.

D. The Students Evaluation

A survey was administered to measure the acceptability of PLMS among 104 students from the three classes [11]. The acceptance statements are based on the Unified Theory of Acceptance and Use of Technology model by [16]. Respondents were asked to evaluate their agreement level of the statements according to the four-point Likert scale choices: 1 – disagree, 2 – somewhat agree, 3 – agree, 4 – strongly agree. The survey questionnaire was distributed in the classroom by the adviser. The questionnaire had been circulated and collected in the class before the end of the second semester of the school year 2015-2016.

The extent of performance expectancy as perceived by the respondents indicates that the respondents perceive the PLMS as a contributing factor to their class productivity in accomplishing tasks. Positively, they viewed PLMS to be useful to them in their class and can increase their classroom productivity. Integrating PLMS in class helps them since the resources, supplementary materials, and activities are already provided for their learning experiences. Survey results show that the extent of effort expectancy of the respondents manifests positive perceptions that the PLMS is easy to use since it is clear and understandable. The usability of learning management system enables the students to exert less effort in the interaction with PLMS. Hence, greater acceptance of the LMS is generated. The result of the attitude shows that the respondents have positive feeling and experience when performing PLMS. The result also implies that teachers have a positive assessment towards the integration and application of PLMS in the classroom. The result of facilitating conditions shows that the students believed that the necessary factors in the successful implementation of PLMS are present. During the implementation, it was noticed by the class advisers that acquiring a USB flash drive is a challenge for the students. Likewise, according to the class advisers, the respondents have limited access to computers. Notably, the extent of self-efficacy towards using PLMS as perceived by the respondents yielded the lowest of all the overall means. The result shows

that the students have a moderate ability to complete some tasks using PLMS. The result implies that the students need more orientation and training before the utilization of PLMS. The result shows the presence of anxiety in performing the PLMS in which students show resistance when they first used the PLMS. The result of behavioral intention to use the system reveals that the respondents are now ready for another implementation of the PLMS.

E. Conclusions and Recommendation

A portable learning management system is a useful tool for mobile learning in areas where internet connection is limited. Teachers must orient the students on the use of any portable learning management system. Schools must develop a way of acquiring USB flash drives especially to those students who cannot afford to purchase. Partnerships and networking with industry and other institutions are recommended.

There are varied ways to integrate portable learning management that is suitable for the institution. Schools must thoroughly evaluate which courses are to be integrated with any learning management system. Schools must be reminded that there are specific learning activities that are not applicable to some courses. Teachers must be creative on how to utilize a portable learning management system into their teaching instruction.

There is a high acceptance to adopt mobile learning among students. Students have a positive outlook towards the implementation of mobile learning. Teachers must be reminded that mobile learning requires commitment and dedication. Schools must support initiatives like this towards the acquisition of the 21st-century learning skills.

Further, there are more facilitating factors than hindering factors in implementing a portable learning management system for mobile learning. There is a need for every stakeholder to understand the concept and operations of mobile learning as well as the necessary pedagogical skills and competencies that mobile learning could offer.

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