Development of Management System for Mobile Learning Application on Android (OS) Tablets: Participatory Enhancement of Local Teachers’ Competency

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Abstract - The purposes of this study were to
1) develop the management system for mobile learning application on Android (OS) Tablets;
2) evaluate the effectiveness of the management system for mobile learning application on Android (OS) Tablets; and 3) survey teachers’ satisfaction towards the management system for mobile learning application on Android (OS) Tablets. The sample consisted of 330 teachers from schools in Ratchaburi Primary Educational Service Area 1. Tools for data collection includes the management system for mobile learning application, evaluation form for measuring effectiveness of the system, and evaluation form of users’ satisfaction toward the system. The statistics used in the research consisted of Mean and Standard Deviation. The results revealed that effectiveness of the system rated by experts was at the very high level of 4.97, and 4.58 by users respectively. In terms of users’ satisfaction, the highest level was at 4.60.

Keywords - Application, Management System, Mobile Learning, Android, Tablets

I. INTRODUCTION

According to the trend in computing preferences, tablets turned to be significant tools in education systems as educational media. With its huge impacts toward the education, currently, the government attempted to particularly provide education support services from government on using IT media for classroom learning, as an example in “One Tablet PC Per Child Scheme”. Within the scheme, it was a foreseeable requisite to prepare the students across the country who participating in it with e-learning readiness beforehand. In this regard, e-learning provision was also to serve the strategic learning plan in the 21\textsuperscript{st} century. The provision for tablet application as the IT tool for learning could bring about 2 interesting prospects as follows; firstly to provide advisory support, and augmentation of teachers’ readiness for enabling them to obtain sufficient knowledge and ability to effectively deliver the instruction; secondly to create interesting and various designs of the application as to implement on the tablet devices, in particular to solve the students’ weakness. In order to
find ways to maximize learning achievement in classroom, there should be consistent development and adjustment on pedagogy. Tablets, in this case, were the tools to promote the effectiveness and achievement in learning [1]. Therefore, well providing for readiness and planning of action were necessity to reach utmost effective classroom conducts. In applying tablets in classroom conducts, it was required systematic planning and creativity in implementing, based on the concept of “Thinking outside the frame” [2]. Since the world paradigm of education was shifted to focus on the learning process instead, the teachers did not play the single role to deliver the message of the learning contents, but they were the co-designers of learning process with the students. They were able to find the learning materials appropriate for learners and building learning environment suitable for enhancing the learners’ skills and competency, as the target to form self-directed and independent learners.

Taking into account the reason of benefit of tablet use, the media and applications installable in the tablets were in public interest, particularly those kinds of drill and practice materials, as to optimize the tablet utility. It would be an advantage if the teachers were able to develop their own applications for their classroom learning as the designs of teaching contents and application components would be best meet the actual needs of the individual learners and the courses. Also, it could help teachers identifying topics and skills that needed more attention in the courses and suited with diversity of students’ characteristics and needs. Moreover, the applications designed by the teachers would identify struggles of each individual and let the students practice on their particular points on demand and self-pace. The constant practice would enable students to improve their learning skills and knowledge as cited in Thorndike’s principle of learning, “Sufficient repetitions of behaviors will lead to habit formation; good practices can promote effective learning ability”. As mentioned earlier, mobile applications for practices and drills significantly came into play in the digital era. Inevitably, only bringing in tablets as a device to use was not sufficient anymore, teachers’ ability to design and develop applications loaded into the device for their own instructions would preferably be additional requirements. In consistent with the digital trend of tablet use, “teacher” was the key variable to creatively and effectively lead in and put the change of the material development into practice.

All in all, the researcher foresaw the significance and benefit of participatory development of the management system for mobile learning applications on Android, from the cooperation taken between the researcher and the local teachers. The cooperative outcomes were the final products which best meet with the students’ ability, requirement and environment. The products were also in consistent with the digital trend. Additionally, they were able to promote teachers’ competency in term of development of instructional materials which were following the world of technology, in the most effective manner.

II. RESEARCH OBJECTIVES

This research aimed at 1) developing the management system for mobile learning application on Android (OS) Tablets; 2) evaluating the effectiveness of the management system for mobile learning application on Android (OS) Tablets; and 3) surveying teachers’ satisfaction toward the management system for mobile learning application on Android (OS) Tablets.

III. MATERIALS AND METHOD

The research procedures were as the following detail:

Population and Sample: they consisted of 330 teachers from schools in Ratchaburi Primary Educational Service Area 1 by using Simple Random Sampling and Taro Yamane’s formula for calculating the sample size.
Research instruments: 1) the management system for mobile learning application, 2) evaluation form for measuring effectiveness of the system, and 3) evaluation form of users’ satisfaction toward the system.

A. Data Collection

The process of data collection was according to the following steps:

1) Study of related documents and theories regarding development management system for mobile learning application, particularly in designing practices and drills.

2) Establishment of a forum in which relevant parties could share their ideas opinions towards the development and design of the application system for tablets, as participatory enhancement of teachers’ competency.

3) Analysis of data collected, as to design the system across the following modules: database design, output design, and input design.

4) Development of the management system for mobile learning application on Android (OS) Tablets.

5) The system test and evaluation: test of all functions and modules of the whole system; evaluation of the system capability and accuracy of the functions for later required improvement and adjustment of the tool, based on all dimensions of users’ demands.

6) Evaluation of the effectiveness of the management system for mobile learning application on Android (OS) Tablets by experts.

7) Establishment of a workshop for teachers on how to use the management system for mobile learning application on Android (OS) Tablets.

8) Evaluation of the users’ satisfaction towards the management system for mobile learning application on Android (OS) Tablets.

B. Data Analysis and Statistics Used

Analysis of the validity of the evaluation form was carried out by using Index of Item Objective Congruence: IOC, and using Cronbach Alpha Coefficient for the reliability. Statistics used consisted of Mean, and Standard Deviation.

IV. RESULTS

According to the result of the system design and development of the management system for mobile learning application on Android (OS) Tablets, it found out that the system development comprised 2 main parts: the first part was for teachers on the process of development of application, which was operated on Desktop; the second part was for students on the process of using the application for learning and practicing, which operated on Android (OS) Tablets as shown in fig. 1.

The capabilities and components of the system were summarized as follows:

1) The drills and practices consisted of 5 different task formats: matching, true/false, multiple choices, fill-in-the-blank, and rearrangement.

2) The basic functions of the systems included simple and effective adding, deleting, as well as editing the activities on tablets.
3) The system could be simply exported and implemented in other types of portable devices such as tablets, smart phones of which contained Android OS.

The result of teachers’ satisfaction overall reached the highest level of the mean of 4.60.

V. DISCUSSION AND CONCLUSION

From the results, the conclusions were briefed as follows:

1) In Developing the system regarding with AEMS system, it had 2 main parts which included the first part for teachers on the process of development of application, which was operated on Desktop; the second part was for students on the process of using the application for learning and practicing, which operated on Android (OS) Tablets.

2) The result of the evaluation of the system effectiveness administered by 2 different raters consisting of the experts and the actual users, overall, was at very high level considering all 3 aspects. The result was consistent with the research on The Application of eDLTV Media to Develop the Games Application for Learning on Tablet, which also revealed that the effectiveness of the application developed by teachers was at very high to highest level [3], and the result from the research on The Development of Mathematical skill exercises Application for Tablet: Case study of Elementary Education Students (grade 1) was found that the effectiveness of the application rated by experts on 3 different aspects, i.e., content, design and overall evaluation revealed at very high level of the mean of 4.79 [4].

The result also corresponded to the research on The Development of Application to Learning on Android in the Subject of Digital Image Processing for Bachelor of Science in Technical Education Program, which showed that the design and the contents evaluated by experts, was at high level of 1.32 according to the theory of Merguigans [5]. In addition, the result of the research on Development of Knowledge Management System for Broadening English Reading Skill on Mobile Phone, also affirmed that the efficiency of the
developed system was at high level rated by group of experts [6].

3) The result of teachers’ satisfaction toward the system revealed that the users satisfied the application, overall, at the highest level of the mean of 4.60, which was consistent with the result of the research on The Application of eDLTV Media to Develop the Games Application for Learning on Tablet. The teachers enjoyed with the training course at the highest level of the mean of 4.67 [3]. The result also was in line with the research on The Development of Mathematical skill exercises Application for Tablet: Case study of Elementary Education Students (grade 1), which was found that the learners had satisfaction level at the mean of 4.28 overall [4]. Moreover, the research on The Development of Addition-Subtraction Skill Exercise for Students of Primary Grade 1 also presented that the learners satisfied with the exercises on Addition-Subtraction at the high level [7]. Additionally, the result of the research on Development of Knowledge Management System for Broadening English Reading Skill on Mobile Phone also affirmed that the students satisfied with the developed system at the “highest” level [6].

To sum up, it was concluded that the management system for mobile learning application on Android (OS) Tablets which developed by the researcher was effectively applicable for teachers as a teaching tool enabling learners to practice on any particular learning subjects, to follow the world evolution of technology, as well as to serve effectively the educational current trend and future tendency.

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(Arranged in the order of citation in the same fashion as the case of Footnotes.)


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