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Application of Learning Management System for Online Learning Modules

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Abstract. In the present decade, education is entering to the world of online learning and focusing to a learner as the center of education. To manage learning system successfully, the education courses: Learning management system (LMS) based on the online learning has been developed. In this study, LMS was developed for Programming Language course for the students of Rajamangala University of Technology Phra Nakhon by using the principle of software development life cycle (SDLC) process. Additionally, the development of the program was done via important major phases of planning analysis, design, implement and evaluated by experts in this field. From 60 randomly selected students of the Faculty of Science and Technology, online Programming Language course providing modules based on LMS model via the Internet showed higher efficiency of 85% than the control in the standard usual instruction procedure. All these aspects of system performance evaluated by the students were also at high level and satisfied with the developed lesson described on the web. Therefore, this online learning system is helpful for all learners in the present information technology world. This system would be further applied for other courses with other additional interactive systems.

Introduction

A Learning Management System (LMS) is applied for higher education management in organizing the instructional system[2]. In this regard, information and communication technologies are used to develope modules to achieve online learning with the principles of e-Learning. Furthermore, LMS is a significant software for administering online education[3]. It consists of various parts as one mechanism for enabling the educational process to proceed well on the Internet network system[5]. The reason is the high potential utilization of available Internet network for transmitting knowledge in a manner that the learners have no need to participate in the class together. It is a means of learning management with no limitation in terms of time and place. The students can learn in accordance with the needs through online modules on the Internet network system. The development of modules with the use of Learning Management System: LMS acts in administering and dealing with all content groups and learning activities, interactive communication between the lecturers and the students, including test creation, examination and evaluation of lessons to meet the objectives of the LMS for online learning modules. This is done by using the process of System Development Life Cycle (SDLC) and the evaluation of effectiveness by experts in computer and information technology. The assessment is based on using Black Box Testing Technique relating to 5 aspects, including 1)Function RequirementTest 2)Function Test 3)Usability Test 4) Performance Test and 5)Security Test. The purposes of this study are to enable the effective system used for education with online modules of computer programming course. The students and general public should be able to access to online learning modules without time restrictions.

Research Methodology

All related documents and research work for developing learning modules were described as follows.

1. The members of the Management System consisted of three components: the administrator, the instructor and the students.

2. The learning management system included opening-closing system, courses and various courseware Settings with LMS. The students were permitted to attend the courses. The uploaded-download was the forms of Text, e-Book, Media, pdf, swf, ppt, and doc file extension. There was sub-system in the management system of adding–deleting files for the instructor and management. Pretest-Posttest was applied in the evaluation and scoring system.

3. LMS showed the outcome reporting system, the system displaying the number of courses, the system showing the number of members and the system showing test scores.

4. The development of management system for online learning modules by using the process of System Development Life Cycle(SDLC) consisted of 6 steps: 1) Problem Definition 2) System Analysis 3) System Design 4) Development System 5) Implementation 6) Evaluation and Maintenance.

5. The development of online learning modules for computer programming course totaling 5 units was done by creating the 50-item test to measure the learning achievement. The quality of the tool was determined, resulting in the reliability K-R#20 equaling 0.82. The effectiveness of the modules with the formula (KW-CAI) [1] was determined with the performance equal to 85%. In conclusion, the developed modules were effective and workable for learning.

Population and Representative Sample

1.The population was a total of 70 undergraduate students of Rajamangal University of Technology Phra Nakhon who enrolled in computer programming course during the first semester of the academic year 2012.

2.The representative sample used in determining the effectiveness of Learning Modules was a total of 60 undergraduate students in computer science program of the Faculty of Science and Technology who enrolled in computer programming course during the second semester of the academic year 2012. Thirty students was applied as the experimental group for learning online modules and 30 persons of the control group for attending regular class.

Results and Discussion

Management system for online learning modules included the results and discussion as follows

Table 1 The mean and standard deviation of learning modules with regard to 5 aspects.

Aspect-based data	Mean	S.D	Level
1. Function Requirement Test	4.52	0.40	Excellent
2. Function Test	4.65	0.35	Excellent
3.Usability Test	4.80	0.05	Excellent
4. Performance Test	4.32	0.39	Good
5. Security Test	4.46	0.47	Good
Overall average	4.55	0.39	Excellent

In Table 1 showed the results to determine the effectiveness of the developed management system for learning modules by the Black Box Testing Technique with regard to 5 aspects. The overall evaluation outcomes of the system indicating the effectiveness an excellent level showed the total average equaling 4.55.

Table 2 The results of comparing the pretest-posttest scores of the students who studied the Learning Modules.

Scores	n	Mean	S.D	t-test
Pretest Scores	30	20.50	6.53	17.68**
Posttest Scores	30	41.03	1.88	

** With statistical significance at the .01 level

In Table 2, the learning scores showed that the students had the mean score of 20.50 before learning online modules and the posttest score mean was 41.03. When comparing the pretest and posttest scores, it was revealed that the average score after learning was higher than the pretest with statistical significance at the .01 level.

Table 3 The results of comparing the learning achievement of the students in the experimental group that learned online modules, and the students in the control group that followed the normal procedure.

Scores	n	Mean	S.D	t-test
Experimental group	30	40.17	2.02	16.67**
Control group	30	30.33	2.52	

** With statistical significance at the .01 level

In Table 3 showed that the mean score of the students in the experimental group was 40.17 and the average score of the control group was 30.33. By comparison, the score of students who learned online modules was higher than that of the students in the regular class with statistical significance at the .01 level.

Table 4 The mean and standard deviation of satisfaction levels of the students who learned through the management system for online learning modules.

Aspect-based data	Mean	S.D	Level
1. Satisfaction with the functioning of the system	4.20	0.77	Good
2. Satisfaction with the presentation format	4.24	0.71	Good
3. Satisfaction with the benefits obtained	4.59	0.59	Excellent
Overall average	4.34	0.69	Good

In Table 4 indicated that overall students were satisfied with the use of management system for learning modules at good level with the average equaling 4.34. The aspect-based consideration showed that the satisfaction with the benefits derived predominates over other facets.

Conclusions

The management system for learning modules comprised the data of the members, the learning management system and the outcome reporting system. This developed system was used for educational purposes. It could support multimedia, picture, audio text and media on the Internet. The study indicated the application corresponding to the research work of Buabangplu [2] Its performance was done for the development of a Learning Management System via Network at the Higher Education Level. To study for modules, the resources available on the Internet network in the environment management was applied to support education in forms of modules so as to optimize learning whereby the students got higher scores of learning [4].

The students were satisfied with the module set without constraints of time and place. The lesson of each unit could be studied in accordance with the aptitude of the learners themselves. Therefore the learning modules developed can be used for educational purposes to benefit the students, instructors and those who are interested in accessing to learning modules. Otherwise, they can be used as parts of remedial classes in related courses. Besides, it is advisable to develop the management system for learning modules to enable interaction between the learners themselves on mobile media or other electronic media with ability to manage learning in other courses.

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