

The Frame Work Design Of Mobile Learning Management System

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Abstract—This paper is focused on frame work design of mobile learning management system which improves learner’s knowledge, performance, achievements, problem solving skills and individual learning system. The frame work design consists of a content module, learning module and evaluation module with learner, teacher and knowledge interface. It supports online, offline, in campus and out campus learning activities. The content module can be divided into five authoring tools i.e. content development, content management, content distribution, content collaboration and content delivery. The wireless technology development leads to restructuring of conventional classroom learning process into mobile learning from group of network with collaborative learning.

Keywords— *mobile learning (m-learning), mobile content (m-content), handheld devices (H/D), electronic white board (e-white board), personal digital assistants (PDA), waveform audio file format (WAV), audio video interleave (AVI), joint photographic experts group (JPEG), moving picture experts group4 (MPEG4), wireless fidelity (wi-fi), hypertext marking language (HTML), MPEG2 audio layer III (MP3).*

I. INTRODUCTION

Education is a process by which a person’s body mind and character are formed and strengthened, which enables a person’s holistic development of personality through knowledge [7]. This knowledge can be improved by the students through their learning environments. In the mobile learning environment, various mobile devices have been used such as mobile phones, PDA, note book computers, Tablet PCs etc. For an effective integration of mobile learning in to wireless classroom environment, it is important for all students in a group to have their own computing device equipped with wireless communication capability to conduct learning tasks. Mobile learning reduces the complicated work and repeated of the teacher. It allows the teacher to the readily available materials, to transfer or broadcast them to the students. The students can view their lessons through video. After watching a video, they can perform the online test and also view their marks. Engaging students in learning activities

includes exploring, organizing online course related resources, answering the questions or assignments using their mobile devices. The m-learning is the method of e-learning which is based on the use of mobile devices anywhere, any time. It is the integration of data service and mobile service [8]. The teaching learning process can be implemented anytime, any where, on any device cost effectively. The faculty and student could get more detailed information about the subject visually within a short duration of time. The learner or the teacher can access the audio-based lessons, video-based lessons from anywhere, in the public places and while traveling by car, bus and train [3].

In psychologically, owning handheld devices increases the student’s motivation and deepens the obligation of learning with mobile devices. The present day generation of adults has a fascination on handheld devices like PDA, smart phones and similar devices. These wireless handheld devices have become very popular in almost all countries and it has been used for educational purposes.

Some students may be slower in learning and understanding. Such students can store and revise their lessons any time, any number of times and learn on their own pace. No need to refer more books for a single topic. In figure1, the content module in the management tool can be useful for students and teachers to download video lessons using the mobile devices, PDA, notebook computers through the wireless network technology.

II. RELATED WORKS

The author described the educational opportunities of teaching in a real time wireless classroom using mobile devices. Conventional classroom learning has certain weaknesses. The author presented a survey from two hundred undergraduate students on the problems faced in conventional classrooms. The main purpose of the research is to enhance the conventional classroom teaching and learning approach, and the author contribution to this research study is to overcome the learning difficulties faced by students in

conventional classroom through the use of mobile devices in wireless classrooms. The survey was conducted with two hundred undergraduate students on the use of mobile devices in a wireless classroom from universities in Malaysia. The questionnaire were distributed to find the weaknesses of conventional learning and the type of mobile learning applications that they would like to use in a classroom using a mobile device, and the five point likert scale can be used for each question. From the survey results, specific mobile learning applications are being developed for students and instructors. These applications could be used on a Pocket PCs, notebook computers and mobile phones. The author provide a variety of instructional application such as classroom, chat room, collaborative text editor, synchronization of power point slides, accessing on the courseware on a mobile device, sending and receiving feedback, emails and accessing to remote computing resources. This research paper provides an effective method of learning through the use of mobile learning in a wireless classroom. Lecturers could monitor student's progress during classroom exercises. Students could able to interact better with their lecturer during class [2].

The author investigates the effect of mobile phone screen size (1.65inches-2.75inches) on video based learning. The author examines the educational benefits of video as a teaching medium and surveys the usage and issues related with video based learning. Then, investigates the value of video in mobile learning and reports on an empirical investigation which studied the effect on the screen-size has on video-based m-learning. The pilot study focused on this aspect of learning and investigates the effect of the type of media (text-based, audio-based or video-based learning resources) used by an m-learning application has on peoples' ability to learn specific practical skills. The m-learning application was presented on a T-mobile PDA which had a screen size of 2.75 inches and a video playback resolution of 320 x 240 pixels. The total of 15 participants, who were all students, took part. Findings indicated that regardless of the screen size of a mobile device, students tended to have a positive overall opinion of m-learning and watching the video significantly increased their knowledge of the subject area. However, some important differences were also noted [3].

The author proposed a Group Area Network or GroupNet, uses handheld devices to fill the gap between Local Area Network and Body Area Network. GroupNet is an independent network where all the members are located at the same place and all handheld devices involved in it are interconnected by peer-to-peer wireless technologies. The GroupNet concept proposed in this study is more focused on the design of a mobile learning management system which

can better support mobile learning for a small group of learners with effective social interaction within proximity. The author describes the architecture of GroupNet and demonstrates its functionality in the specific area of mobile learning. GroupNet uses handheld devices as the main hardware and GroupNet architecture consists of four layers. Various mobile learning scenarios are also described in detail to give guidance to instructors. The GroupNet architecture consists of four layers, from the lowest to highest: Network, GroupNet kernel, GroupNet applications and GroupNet application user interface layers. GroupNet uses handheld devices as the main hardware, these handheld devices are located in the same ad hoc network, and every device could act as either a server or a client. In the network layer, to achieve the mobility of GroupNet, appropriate wireless standards are IEEE 802.11 (wi-fi) and IEEE 802.15 (Bluetooth), which can inter connect handheld devices using peer-to-peer connection. TCP/IP protocol suite is employed to develop GroupNet kernel functions. The function of the GroupNet kernel is the activity control, online status, files sharing, message passing and session recording. GroupNet concept is designed to support group tasks, thus the GroupNet application are also designed and implemented according to the nature of group tasks. These scenarios apply GroupNet to Collaborative learning activities and situated learning activities. With rapid growth of mobile technology and global business context, many more possible scenarios of using GroupNet are expected to emerge in the future. This investigation introduced a new mobile network concept named GroupNet that could be used to support group collaborative tasks. A small number of people could get together anywhere and anytime, and handle collaborative tasks together supported by wirelessly interconnected handheld devices within GroupNet environment. GroupNet concept proposed in this study is more focused onto the design of mobile learning management system (m-LMS) which can better support mobile learning for a small group of learners with effective social interaction within proximity. This study demonstrated two scenarios for applying GroupNet to learning activities and GroupNet could be used in various areas with various applications [4].

The researcher develops a Mobile-based Interactive Learning Environment (MOBILE) for aiding elementary school English learning. The MOBILE consists of a mobile learning server and mobile learning tools, which is able to support in-or-outdoor learning activities. Several theme-based mobile learning activities have been conducted. An experimental result obtained from post test indicates that the effect of learning via MOBILE is better than that of the traditional manner. Besides, the student questionnaire result also shows that most students like to use the MOBILE to learn

English as well as other courses since it is easy to use and can increase learning interest and effect [5].

A case study method is utilized and the science club with 46 fourth grade students is selected in this study. The author has examining the effects of learning activities on the students’ performance of learning aquatic plants. Besides, a set of quantitative and qualitative data were collected from the case study to document the learning effects and the students’ perceptions of the learning activities, and to discuss factors underlying these effects and students perceptions. The results indicate that the learning activities can enhance students’ scientific performances, including both knowledge and understanding levels. This study identifies two factors that are prominent in the positive effects; student’s engaging in ‘mobile technology supported’ observation during their scientific inquiry; and students’ engaging in ‘mobile technology supported’ manipulation during their scientific inquiry [1].

III. ARCHITECTURE OF M-LEARNING MANAGEMENT SYSTEM

A. Content module

The figure1 shows the frame work design of mobile learning management system; it consists of three modules with two interfaces. They are content module, learning module and knowledge module. In the figure2, shows that the content module consists of five authoring tools i.e. development, management, distribution, collaboration and delivery. In the development tool, content may be developed based on the Dale’s cone of experience [6], it contains the words or text, images, audio, video, graphics and animations,

demonstration of the topic. It mentions the passive learning and also it contains a variety of questions like multiple choice, true or false, short answers and descriptive answers types. It is called as active learning. In this cone of experience of learning process, it improves the student’s passive learning approach to active learning. The major content types are web pages in HTML, images in JPEG, Text in PDF or word format, Audio in MP3 or WAV, Video in AVI and MPEG4, animations in flash for the teaches, there is no need to dictate the notes in the classroom to the students. Instant available materials can be used in online or offline campus. The teacher or subject experts can develop the m-content with video-based lessons which includes text-based and audio-based lessons. The learners can get the more ability to execute new problems, new ideas and strengthen their knowledge.

The management tool contains the storing, retrieving and browsing the required content and the content can also be imported or exported. The distribution tool, m-content can be distributed through the database servers and web servers, the database server contains the login address and password, they instantly get the details about their personal information, class schedules, time table. From the web server the learner’s can download the syllabus, assignments and video-based lessons. The collaboration tool used to share the knowledge with other learners and teachers with the collected information and experience. The delivery tool can act as m-content which can access via the wireless networks such as wi-fi, Bluetooth using mobile phones through internet enabled equipments (web-based learning) like PDA, notebook computers, palm tops, tablet PCs etc. The use of mobile devices is to delivery performance support and to teach through communication, which are the two important primary delivery strategies.



Figure1: The frame of Mobile Learning Management System

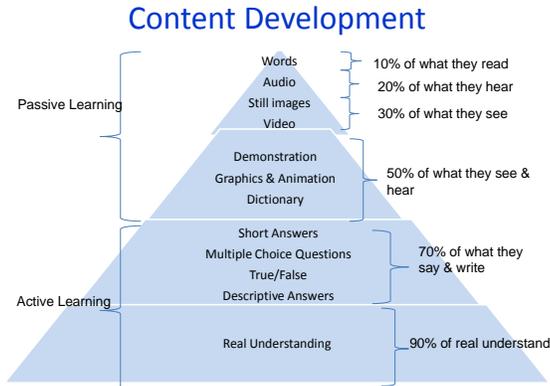


Figure 2: Content Development [6]

B. Learning Module

Learning can be classified in two well known methods such as behaviorism and constructivism

Behaviorism: This states that the learning is a change in behavior that can be observed and measured. The behaviorist approach is evident in much corporate technical training and technical colleges because it focuses on teaching observable and measurable skills. Much of the instruction is focused on helping learners build the capacity to perform these skills (behaviors) without unnecessary assistance [9].

Constructivism: This states that learning is an active process in which learners construct new ideas or concepts based on their current and past knowledge. This approach is evident in many academic courses and management education programs because they focus on the acquisition of concepts and their situational application. In the constructivist approach, much instruction is focused on helping learners develop their critical thinking skills. A constructivist approach is effective for teaching learners about the application of principles and policies [9].

Learner's can increase understanding styles through learning process using online synchronous or offline asynchronous communication, these communication is depends on the mobile equipment, internet reliability. Active learning is much better than passive learning because it can be recalled, enjoyed and understood. An active method develops our own thinking to improve our conceptualizations of what we are learning. During this process we physically make neural connections in our brain. This is the process we call learning. Passive learning such as listening, do not require us to make these neural connections or conceptualizations [6].

Active learning involves learners in learning activities that are authentic to the work and social contexts in which the skills or knowledge are normally embedded with the real world tasks and situations. The effective active learning experience involves a partnership process. The teacher continues to have an important role in identifying relevant and appropriate learning outcomes, in designing experiences and activities that will engage learners in the experience and critical reflection in order to make sense of what they learn, in managing the process of activity and assessing the achievement of learning outcomes. However, while maintaining an overall role as a 'teaching practitioner, within an active learning approach, the teacher may share this role with the learners and they are encouraged and enabled to become self-directed, to manage and monitor their own learning appropriate to the task and their ability [9].

Teacher can conduct the assessment test, online test through this learning module. The learners to access the syllabus, schedules, assignments through wireless networks using mobile phones or wireless devices like PDA, note book computers etc.,. This type of learning can be individualized or personalized self-learning which enhances the problem solving skills and improve their knowledge. It can be easy accessible, privacy, immediacy, permanency. Wireless technology learning system is a state-of-the-art in the field of m-learning due to the benefits of privacy, immediacy, flexibility, accessibility, reliability, security, mobility, reusability, interactivity provided by the video-based content. The learners or teachers have the ability to learn contents from the multiple sources on different devices notebook computer, etc. The learners and teachers can have a close relationship by solving the problems and completing the assignments together. The mobile learning management system can increase the thinking skills, performance and knowledge sharing to learners.

C. Evaluation Module

Wireless mobile learning is two types, m-learning as a form of performance support and m-learning as communication that creates knowledge. The m-learning as communication takes a different approach is based on constructivist theories of learning and stem from learners and experts constructing knowledge in an authentic context. Wireless m-learning performance support systems are similar to traditional support. The m-learning solutions integrate mobile devices with the work to help the user perform a task by providing information, guidance and learning experiences when and where needed [9].

Wireless m-learning uses the performance support and training where the actual work takes place, allow new skills or knowledge to be immediately applied, enables training when it is needed and allows use of rich media when appropriate. The m-learning as communication may be controversial. This m-learning knowledge is derived from collaboration with experts or collaboration with one-to-one method. The challenge for training professionals will be to acknowledge and realize that there is not a formal role for the trainer or instructional designer to play [9].

The student may access the wireless network using mobile devices when there is a need to connect to learn from teachers. For example, at the time of study holidays the student may solve with the problems. The student to process of evaluating the teacher's database and they need to learn more about the problem solving skills from their data.

To identify the knowledge level of the learner, to generate new ideas, to explore questions, to develop broader, deeper understanding and skills to operate the investigation. The teacher evaluates students' performance towards achieving the instructional method. Learners assess their understanding and abilities. It consists of knowledge acquiring and knowledge sharing with other learners and teachers. To get the valuable knowledge from the learning module contains the learners' personal data, performance, behavior and content consequence that were presented in the evaluation results. The evaluation stage provides different headings or explanatory words to help authors and learners self-review of video-based lessons and templates. Hence the evaluation system which overcomes the problems and promotes learning during examinations should be encouraged for which technology has to be used in teaching, learning process.

D. Learner/Teacher Interface

This interface supports

- Synchronous or asynchronous communication of education.
- Learner or teacher can save or retrieve and import or export the file any format on any required wireless device.
- Deliver the lessons, anytime, anywhere, on any wireless device.
- Collaboration used to share the knowledge with other learners and teachers with the required data.
- Access the readily available materials on text-based, audio-based, and video-based lessons.

The students can use this video as the alternate or supplemental sources for their learning. In the adult point of view, the theory subject is very boring and vague, the teacher can develop the video for this type of theory subject, the student can use this as the supplemental source of their learning which will be helpful and also motivate the student in learning the difficult topics.

E. Knowledge Interface

In the knowledge interface,

- Through the interactive learning to increase the knowledge, performance and skills.
- Through the individualized learning to enhance motivation and to provide different methods of learning styles.
- The m-learning knowledge is collaboration with one-to-many method.

Visual is more advantage than learners reading, if the learners watch the video two or three times the observation of the particular subject could increases automatically.

IV. CONCLUSION AND FUTURE WORK

This paper considers a mobile learning management system is based on the content development, management, distribution, collaboration and delivery system of the learning process. Mobile phones, PDA, notebook computers can be used to download the video-based lessons using through the wireless network technology. The mobile learning management systems allow learners to collaborate through an online or offline interaction with teachers and other learners. The learners can increase their performance through the learning module and evaluation module. The educational process will become more flexible and to the needs of life long learning. The m-learning can also be a good educational tool for disabled people.

For further research, will be analyzing the usage of video lessons in a wireless classroom with the wireless devices to arrive out the results of learning effectiveness, performance and the system quality of wireless handheld devices.

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