DEVELOPMENT OF CONTENT FOR M-LEARNING

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ABSTRACT—**There has been noticeable advancement in mobile technology. The lay mans' perception of a mobile as mere communication device underwent significant changes. One such change is M-learning which has taken its roots from e-learning. Mobile learning (M-learning) provides educational opportunities through mobile phones, PDA, digital media players. The best feature about M-learning is that exact information can be grasped anytime, anywhere without many constraints. Though, M-learning requires researcher's attention in developing issues, processing capabilities and small screen displays.**

The paper discusses about mobile learning technologies, opportunities and challenges for success of M-learning. It is observed that most of the students in India have mobile phones and m-learning is an upcoming research field that aims at effective transition of learning tools from digital boards to hand held devices. Developing of M-learning content is a Herculean task in today's date as the content developed should enable a smooth transition for the students from e-learning/class room learning to M-learning. During research, content development was carried out to lay the basis for presentation style, file formats and their playback capabilities using mobile phones.

Keywords-**Mobile Learning, E-learning, Mobile Content, Design issues for mobile learning.**

I.   INTRODUCTION

Usage of internet for seeking information is very common these days. Usage of smartphones for day-to-day activities has increased significantly due to the development of smart applications using smart content that interact with the user in a one-to one manner. Moreover applications have been developed in sectors like banking, shopping, travel etc. Hence the development of mobile applications to the field of M-learning should be a simple extension of the widely accepted e-learning content that the user is familiar with today. With the advancement of M-learning the application would enable a student to on the go learning. The student can directly interact with the smart content of the M-learning application that would enable them to view their lessons and also give a small quiz to review their progress. Further the smart application would also enable a student to store their progress on the database or any available server for their future reference.

This paper is organised as follows: Section II deals with M-learning opportunities and challenges. Section III deals with research work in the area of M-learning content. Section IV discusses guidelines for developing M-learning content.

II.   M-learning opportunities and challenges

E-learning refers to the use of technology in learning and education. There are several aspects to describing the intellectual and technical development of e-learning, which can be categorized into discrete areas.

Aspects of E-Learning

Education   Technology   Administrative tools
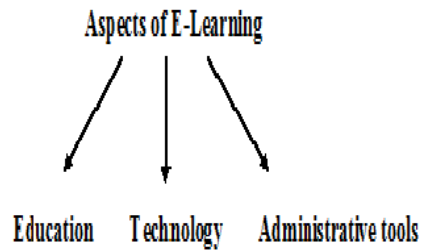
- E-learning as an educational approach or tool that supports traditional subjects
- E-learning as a technological medium that assists in the communication of knowledge, and its development.
- E-learning administrative tools such as education management information systems (EMIS).

M-learning:

The term m-learning or "mobile learning" refers to a subset of e-learning, educational technology and distance education that focuses on learning across contexts and learning with mobile devices. Mobile learning is any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies. In other words, with the use of mobile devices, learners can learn anywhere and at any time. Using mobile application for learning aides and materials has become an important part of informal learning.

Another basic challenge for the development of the application is the reusability and interoperability of the content developed. This challenge is amended by using the SCORM standards for the content development that enable easy interoperability. Moreover the content can also be compatible with any Learning Management System(LMS) for the ease of access and lesson development. SCORM is a set of technical standards for e-learning software products.

SCORM tells programmers how to write their code so that it can work well with other e-learning software.Specifically, SCORM governs how online learning content and Learning Management Systems (LMSs) communicate with each other. SCORM does not speak to instructional design; it is purely a technical standard. SCORM integrates a set of related technical standards, specifications, and guidelines designed to meet SCORM's high-level requirements—accessible, interoperable, durable, and reusable content and systems.

Accessing the built in Application pose a serious challenge because of varying device features in terms of hardware and software capabilities. For example, streaming video requires a minimum bandwidth of 256Kbps which is not very common when we look at mobile wireless channels in India.

Technology challenges include limited connectivity, battery life, small screen size, low memory, local language support, etc. Apart from technological challenges there might be monetary constraints, educational challenges including access to learning outside classroom, device support which developer must keep in mind before developing any M-learning application.

Moreover a few challenges found during our research are concluded as follows:

- Number of file/asset formats supported by a specific device
- Content security or copyright issue from authoring group
- Multiple standards, multiple screen sizes, multiple operating systems
- Reworking existing E-Learning materials for mobile platforms
- Meeting required bandwidth for nonstop/fast streaming

- Tracking of results and proper use of this information is not possible

- Restriction on learning timetable

- No access to and use of the technology in developing countries

- No just-in-time (J.I.T.) learning

- No feasibility on storage of the Application on Cloud

- Requirement of LMS is compulsory to run the Application

- Re-usability of learning and testing content is not possible

III Guidelines for developing M-learning content.

Firstly, the design used for the development of e-learning content cannot be applied to m-learning as learners in this case use mobile phones which have considerably a smaller screen size when compared to that of the desktop. With the varied features, capabilities and operating systems of the mobile phones available it is of utmost priority to develop content which is interoperable and is not undermined by any of the above mentioned limitations. The following guidelines may be followed for developing of m-learning content.

A. Short and attractive content:

The designer must focus on development of short and attractive content for the comfort of the end user. The content needs to be to the point and short as the mobile phones have a very limited memory available. There is no point in developing a heavy application whose capabilities the user cannot avail due to memory constraint. Moreover the content should be attractive as the user can only focus for a limited time on the small screen.

B. Limit high level of graphics

The applications rendering high graphical content may increase processor load and drain battery power. The developed content should have limited Data entry. Navigation to other pages should be provided using hyperlinks or big size buttons to restrain memory usage.

C. Interoperability

The content should be developed to support any screen resolution and operating system as well so that user should not face any issues in displaying the content.

D. Interactive Design

The Graphical user interface should focus on engaging and thus enabling learner interaction. E-learning and flash based interactivities and widgets such as roll over, buttons should be used to make m-learning more interactive and fun based. There should always be simple quizzes that evaluate learners understanding of the subject. Such an application feature not only provides interactivity but also engages learner in education.

IV Research experiment results achieved

Our project, is developed as a Mobile Application and is built using Flash Builder following the SCORM standards. The Application provides Lessons for the distant learning Users which are informative in order to help them grasping knowledge in required fields such as various Computer Languages. The Users can opt for quizzes provided in the application to test them after completing the learned lessons. Moreover, the application can be uploaded in any Learning Management System (LMS) as it is SCORM standardized where the results of the quizzes undertaken by the user can be analyzed by various graphical representations such as bar graphs, pie

charts, etc. The SCORM compatibility can be tested by uploading the application in SCORM Cloud. Further, the Application has been provided with the PhP Script to report the scores to an internal database/server. The user can easily modify the Script to upload the results according to the user's database. The main purpose of developing this Application is to serve the purpose of users preferring to learn without any time and place constraints and for acquisition of technological skills by using mobile devices, computers, etc. The App also brings strong portability by replacing books and notes with small RAMs, filled with tailored learning contents. In addition, it is simple to utilize mobile learning for a more effective and entertaining experience.

The content developed also supports video based learning which has been provided as a navigation to another URL feature thereby reducing memory usage and enabling e-learning type experience to the user. Moreover the GUI developed is quite interactive and involves learners complete attention and interaction. The sample content images are as follows:-

Interactive Flash Content   Quiz with Radio Buttons
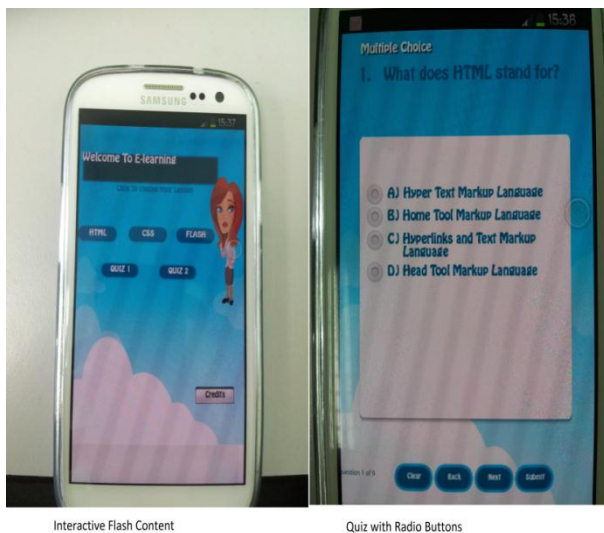
Although mobile content development guidelines were formulated, guidelines followed for developing content for one subject may not be useful for others. Let us consider HTML programming and soft skills. For HTML focus should be on explaining fundamental concepts with illustrative examples where as for soft skills focus may be on grammar, pronunciation etc.

V Conclusion

The paper discussed about m-learning technology and challenges. Approach for context design was also discussed formally. The adoption of M-Learning in tertiary settings would appear to be underway, though it is still in its infancy. The early trials of m-learning in tertiary settings indicate that the successful adoption of this technology is largely dependent on issues of design and fit. With careful planning, we aim to harness learning potential of m-learning in a meaningful and contributory manner. The feasibility of implementation of m-learning would appear to be a strength with the prevalence of WiFi hotspots across campuses and the prevalency of smart phones among the student and teaching body. We wish many revolutions in m-learning and want m-learning to become a powerful tool in the coming century to revolutionize the current learning system. Digital board learning and the traditional moodle quizzes need a break and with this application we would like to lay the foundation for the same.

References

[1] TRAI press release no:19112012, dated October 09, 2012

www.trai.gov.in

[2] http://en.wikipedia.org/wikiIMLearning

[3] KumarMandula, SrinivasaRaoMeda, Dhanendar Kumar Jain,"Research and Implementation of Mobile Video Streaming Application for Ubiquitous Learning", IEEE International Conference on Technology Enhanced Education(ICTEE),Kerala, India, 2012

[4] Ganesh Narayana Murthy, SridharIyer, "Study Element Based Adaptation of Lecture Videos to Mobile Devices", National Conference on Communications(NCC), 2010

[5] Masters, Ken (2005) Low-key m-learning: a realistic introduction of m-learning to developing countries. Seeing, Understanding, Learning in the Mobile Age, Budapest, Hungary, April 2005