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Effectiveness of a Mobile Educational Learning Using a QRBased U-Learning for Personalized Tutoring

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ABSTRACT

The main aim of the project is to propose a QR-based U-Learning Material Production System (QR-ULMPS) to develop context-aware u-learning environment during outdoor learning activities. As portability and mobility are necessary factors for an authentic outdoor learning experience, our QR-ULMPS needed to incorporate versatile mobile devices. With the help of word net tool and natural language processing technique, synonyms and antonyms are being generated for the difficult words in context aware u-learning materials. We can tag images, videos and audios for the content to reduce the technical barrier for the u-learning student's. The application of QR code technology not only support students in accessing online information materials via mobile devices, but also fulfilled all of the context-aware ulearning environment needs of teachers using the system. Issues are resolved by QRULMPS during conventional outdoor teaching approaches, which are often very time-consuming and labor intensive.

Keywords: Context-Aware Ubiquitous Learning, Natural Language Processing, Outdoor Learning.

I. INTRODUCTION

The learning aspects such as m learning are learning across multiple Interactions with portable technologies. New delivery mechanism is provided by the mobile learning model to overcome space and time limitations of traditional classroom learning [1], [2]. The context-aware ubiquitous learning concept is used to identify a novel learning environment, by which the students can be taught with the content appropriately at the right time and in the right place[3], [4].

The advancement of u-learning environment is done using the development of the radio-frequency identification. Using RFID technique, the learning behavior of students in the real world is recorded. However, many teachers lack coding skills and do not have sufficient Programming knowledge to use the RFID technique [5]. When dealing with the complexities of RFID tag production, during such situation it will be difficult for the RFID tags to be printed using traditional printers, it either requires industrial grade or specially designed printers. Especially when the RFID technique is used in a mobile context [6], [7]. During the use of Quick Response (QR) codes in conjunction with a context aware u-learning system, teachers used to create customizable context-aware ulearning materials without expert assistance. The QR code is capable of handling enormous information at a time. The integration of QR codes can connect users to information quickly and easily[8], while the low technical barrier of creating u-learning educational materials brings an easy accessibility to code readers Which allows teachers to build modern learning environments without any hassle. QR codes have become widely popular and increasingly used in mobile learning applications [9].

The students who are assigned to the advanced u-learning system attained desirable results than participants learning via conventional methods based on the results of Instructional Materials Motivation Survey. We believe that the proposed ulearning system is advantageous because it motivates students and allows

for higher levels of engagement, particularly during outdoor learning activities. Thus, we conclude that the u-learning system can create a learning experience that both interests and engages students.

The reminders are structured as follows: Section 2 briefly reviews the related work. The methods and materials are respectively introduced in the section 3. Finally, Section 4 outlines the result and discussion. Section 5 includes the conclusion of our project.

Related Work

1. U-Learning

The advancement of sensing technologies, such as RFID (Radio Frequency Identification), QR (Quick Response), barcode tags [10], [11] has brought us a new form of technology enhanced education. The characteristic of ubiquitous learning refers that the information can be appeared or found everywhere.

2. Radio-Frequency Identification

The RFID technique has spurred the advancement of context-aware u-learning Environments. With the help of the RFID technique, u-learning system can detect and record students' learning behaviors in the real world, and enables students to learn content found in the real world "actual space" rather than in cyberspace. It is not uncommon for educator to face a number of issues when working with RFID systems, particularly when dealing with the complexities of RFID tag production. This is because RFID tags cannot be printed using traditional printers.

3. QR-Code

QR codes can scan and encode large amount of data, but not limited to URLs, and text. A QR code allows educators to include teaching content in the u-learning content and QR code readers are used in mobile devices.

II. METHODS AND MATERIAL

The two main factors are mobility and port-ability that incorporate touch screen mobile device. The teachers are supported with QR based multimedia materials editing system which make it simple for the author's teaching content and to create QR codes. Admin has to process and manages the entire architectural system. Once the teacher is provided with new files they can automatically prepare customized u-learning material.

Once a multimedia material package is been created by the teacher, they are able to edit individual teaching contents to the code. QR codes embed data that links the

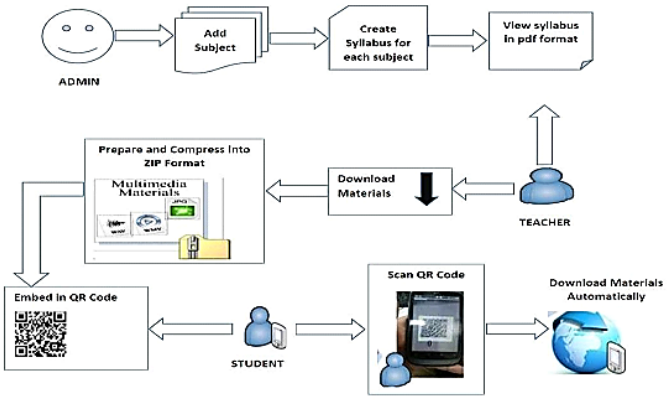

Figure 1: Architecture Diagram

Corresponding multimedia material package to the appropriate Content and makes it possible for the user using mobile device to scan QR codes placed in the existing real world and links them back to relevant class materials. Finally, the multimedia material server provides a dynamic web page for teachers to manage their collection of Ulearning materials.

The u-learning system will decode the internal information contained in the QR code, and using that multimedia material package will be coded. Then, the relevant materials designed by the teacher can be used by the students, without hassle directly from their mobile devices.

Teacher prepares the material based on context aware u-learning system, for Difficult words with synonyms using natural learning technique. To easily understand the concepts images, videos, audios are been tagged and hyperlink is used. The QR code application, automatically recognize the URL contents in the QR and redirect it to the browser in android and trigger the URL to download the U-learning material. The Ulearning material can be viewed in offline mode. Study Materials will be automatically downloaded after scanning the QR-code.

1. Syllabus Creation

In this module, admin login into QR U learning website. Then admin have to upload whole syllabus. The PDF contents of whole syllabus are parsed to text contents by copy paste operation. A new syllabus is created for that particular subject. Each and every subject syllabus is created in similar ways. Admin can view the entire syllabus.

2. Subject Allocation and Teacher login

In this module teacher should register the details like name, address, and subject specialization. Admin can view all the teacher details and allocate the syllabus to particular teacher. While login in QR u learning website the syllabus allocated by the admin will be shown and can be downloaded.

3. U-learning multimedia material production system

Teacher allocated syllabus are displayed by units. If the teacher select the unit x (unit 1) that particular unit syllabus will be displayed. Then teacher will choose the particular content in a unit syllabus. The teacher will upload the core content and relative content for the selected content in a unit syllabus. Inside the core content the important words are mapped and tags meanings.

4. QR-code generation and ULMPS

In this module the already created core content view by the teacher. When mapping is finished the teacher click to create multimedia material button. The material are compressed in to zip file format and mapped content are created a new java server page (jsp) page the page verified by the teacher and click to generate QR code. After the QR codes are generated, teacher provides the QR code to the student. The student scans the QR code in electronic devices (android mobile phone) and the related content is downloaded to student mobile.

III. RESULT AND DISCUSSION

Nowadays the researchers focus on the way of using new technologies in the current world to enable anyone to learn at anyplace at any time. With the help of smart mobile phones, contactless smart cards, handheld terminals, wireless communication and sensing technologies such as RFID or QR code enhances the learning system to detect the learning status of students in the authentic world and provide learning support to them, includes delivering supplementary learning materials and hints to the learning tasks. In the proposed system outdoor learning activity is done using offline reading. Such a form of technology enhanced learning has been named “context aware ubiquitous learning”.

IV. CONCLUSION

The advancement of QR-based U-Learning Material Production System (QRULMPS) that truly helps teachers to build a context-aware u-learning environment, which supports students in obtaining adequate knowledge during outdoor teaching activities. It provides engaging self-learning opportunities for students to review teaching content and brush up on related materials.

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