QR CODES IN THE PROJECT-BASED LEARNING

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Abstract

The purpose of this study was to explore the possibilities of QR (bar) codes in the context of project based learning. However, we believe the movement of using QR codes in education is still in its infancy. Apart from our own research in this area, this paper explores the possibilities beyond the simple use of the codes and offers some suggestions on how the technology can be used to its full potential. We have demonstrated five project activities where the teacher can easily apply QR codes.

In addition, this article can be used as a learning model, and can also inspire educators to explore this exciting topic of mobile learning.

Keywords*:* mobile learning, QR code, project training, activities, technology.

1. INTRODUCTION

Mobile learning includes all kinds of technological improvements in the educational process with the help of smartphones, tablets, applications etc., but in fact all these technological tricks are aimed only at creating a new educational environment, in which knowledge is freely distributed among the participants of the entire communication process.

One of the modern technologies used in the educational process is QR codes. QR codes have become a ubiquitous part of the everyday life of modern citizens. Nowadays one can find them everywhere: at the back of a box of cereal, on giant posters at bus stops and on advertisements in the windows of different objects in the street. In order to talk about QR codes in the educational environment we have to define what the QR code is. QR, or *Quick Response codes*, are two-dimensional barcodes that can be read using smartphones,

tablets, laptops and dedicated QR reading devices. [1] In short, these are small information gained barcodes, which can contain quite a lot of encoded information (for example, up to 7089 digits or 4296 letters and numbers)..

QR technology provides a wealth of benefits for the techno-friendly teacher. Besides the fact that most students own mobile phones that can read QR codes in seconds, they also often have access to laptops in school. Students will not be fazed by a technology that they have probably used outside school already. On the contrary, they are likely to get excited at the prospect of opening new possibilities for learning a language. [1] Listed below are the main reasons why QR codes are an integral part of education:

1. QR codes can hold over 4000 characters of information. Instead of printing out a long web article to the students, QR codes could give them direct and instantaneous access to the same resource in class or at home. The teacher saves time.

2. They are very easy to generate. To create a QR code, the teacher only needs to copy and paste the address of a web page into a QR generating software. Once the code have been produced, the teacher can then transfer it to a teaching resource, or simply leave it on the interactive whiteboard for students to scan in class.

Initially, QR Code was developed by Denso-Wave, a Japanese automatic data capture equipment company (Denso, 2009), in 1994.[2]

Image 1. The structure of QR code[1]

According to Ching-yin Law Simon So (Hong Kong Institute of Education), by linking the QR codes on a paper-based task to the multimedia resources deposited on the Web with just two simple operations provide a very efficient and flexible way for students to obtain the resources ubiquitously. [2] The resources could be video clips, news clips or simply a Web page. Many researchers believe that the possibility of applying QR codes for teaching and learning in this way is unlimited.

QR codes link directly to articles, emails, websites, phone numbers, videos, social media pages and more. All you need is a camera lens on your device and a QR code scanning programme which can be downloaded online for free as an application. The functions of QR code are given as follows:
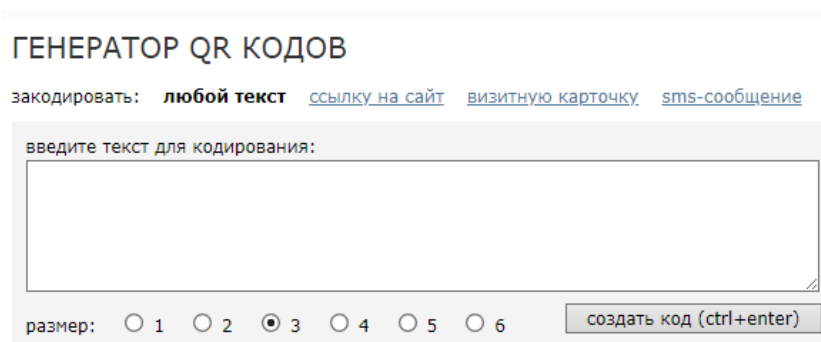

Image 2. The QR Code Generator [2]

URL:

A person has to paste a URL of your choice in the destination box and the scanner of a Visual QR Code will be redirected to that webpage. It is useful for advertising sites and products; this greatly enhances the accessibility of a product to the public.

vCard:

A person can use a Visual QR Code to create a contact in a scanner's address book. It is especially useful for business cards; this eliminates the awkward process of exchanging details and printing out endless cards. One has to add a Visual QR code to a card and anyone who scans it will have contact details automatically entered in his/her address book.

YouTube Video:

A person can use a Visual QR code to redirect the scanner to a specific YouTube video. This can be very convenient in how-to manuals and explanatory videos. One does not have to paste the entire URL of the YouTube video, its ID is sufficient for a generator to recognize the desired video.

Google Maps:

One can also enter a location in the destination box and the scanners of a Visual QR Code will be redirected to the location on Google Maps and directed there using Waze.

Plain text:

A person can use a Visual QR Code as an especially creative way to merge a message into a picture. Anyone who scans the Visual QR Code will be redirected to the text of a person's choice – a unique, memorable way to pass a message.

Phone number:

Using this simple technique, anyone who scans a Visual QR Code will automatically call the number that someone has specified in the destination box.

Skype Username:

An especially ingenious twist for those who wish to employ their Skype account, this technology enables a person to enter a Skype username in the destination box and anyone who scans a Visual QR Code will automatically call that user via Skype.

Email Address:

Anyone who scans a QR Code will have a "compose email" box opened on their phone that's addressed to the address that a person has entered in the destination box.[3]

Taking into account all the possibilities of QR code technologies, using QR code in project-based learning will be a powerful key to drag learners' attention. Actually, if we use it in the Project-based learning (PBL) it will be motivational tool for students to learn research methodology skills. It is a way to engage and give them ownership over their own learning.

Project Based Learning, or PBL, is an instructional approach built upon learning activities and real tasks that have brought challenges for students to solve. These activities generally reflect the types of learning and work people do in the everyday world outside the classroom. PBL is generally done by groups of students working together toward a common goal. [6]

According to Douglas S. Fleming, Projects are intensive experiences that engage students in activities that are interesting to them and important to the course(s) of study. They can involve community members and settings, and they often result in an exhibition or product for a real-world purpose or audience. The typical project lasts for two to eight weeks. [7]

The Buck Institute for Education (Boss, 2013) has identified four phases that happen in every well-designed project. [8]

1. *Project launch:* This typically starts with an entry event to ignite curiosity and introduces a driving question to frame the inquiry experience.

2. *Knowledge building:* Students build background understanding and learn new skills to help them answer the driving question.

3. *Product development and critique:* Students apply what they have learned to create something new (such as a product, solution, or recommendation).

4. *Final presentation and reflection*: Students share their polished work with an authentic audience.

PBL places students in realistic, contextualized, problem-solving environments. In so doing, projects can

serve to build bridges between phenomena in the classroom and real-life experiences. The question and answers that arise in their daily enterprise are given value and are shown to be open to the systematic enquiry. Hence, project-based education requires active engagement of the student's effort over an extended time. They also promote links among subject-matter disciplines and present an expanded, rather than a narrow view of the subject matter.[4]

The use of QR codes in project work enhances the motivation of students and increases their interest towards the subject. Curiosity for a new things, in our case this is a QR code, the students strive to show the best results, therefore they develop critical thinking and creativeness. Consequently, practicing this application in real life atmosphere the students will develop not only thinking skills, but also the brain hemisphere will actively work. What matters here is the activities with QR codes, which may support PBL. In particular, there is a list of activities that teachers may use in practice.

2. QR CODE PROJECT ACTIVITIES

2.1 "QR code map"

Procedure. The teacher issues the equipment necessary for the passage of the quest (smartphone or tablet) and explains the principle of the QR-scanner application. After acquaintance with the general characteristics of the game, participants are given the first hint code, indicating the direction of movement and the next location.

After decoding the code, the participants begin to move along the route. Movement is carried out only by participants, without the accompaniment of the teacher. Communication with the teacher and control of the correctness of the task is accomplished through mobile. As soon as the team guesses the task (the answer), it gets a hint about finding all the QR-codes. Each team will have to solve 3 stages to get 3 different exercises, which will be useful to them in the continuation of the quest.

One of the best examples of this game is perfectly shown in the work of Achildiev T. A. and Sokolov V. A (ГБОУ СОШ № 548, Санкт-Петербург.)[5]

Achildiev T. A. is an English teacher, Member of the project "Mobile learning". Developer (co-author): Site-project "QR-code Smart Teaching" and Head of the UID (Young Movement Inspector) team.

Actually, in "Mobile learning" project she demonstrated the QR codes and created an interesting game map. Each QR codes here, keep different relevant exercises. This activity consists of three stages and it looks like a full of adventure journey to Australia.

Image 3. The secret of the green continent

2.2 Quest "Miracle World"

This PBL game allows students to go on a magical journey with downloadable images and QR codes that are hidden in different places of the school. Finding such a code, you need to go through a small "quest", in which students will meet different riddles, and for the victory over which you need to find answers and collect the things that you already have founded according to yours answer. In the end, you need to write a short essay about what happened in the game.

2.3 Cards

QR codes can easily be placed on maps, for example, on a world map. QR codes can contain travel information or brief information about the culture and history of individual places, links to books about your state or province. Ask students to write about how the book reflects the place. QR codes can be placed on the state and linked to information about a book telling about this state. Different colored codes can represent different ages in history.[9]

2.4 Qr-code school journal

One of the excellent projects in teaching target language can be creating a school journal. Of course, if we add Qr codes in it, the journal can talk with the readers. In this case, everyone can follow the idea what the author wanted to explain us!

2.5 Creating a Fairy-tale book

It is another way to make the project interesting. So the readers can not only just read the story but they may watch the whole story at the same time! Little Qr codes help us to illustrate the white and black colour pages into colorful and vivid ones.

3. CONCLUSION

It comes us no surprise that using QR code in teaching English, makes the learning process more interesting and even so, it may turn the lesson into adventure travel. Undoubtedly, every student will enjoy such lessons.

On the other hand the printed or the paper-based materials are still essential for deployment of information like books, newspapers, research papers, letters etc. Using QR Codes on printed materials like course books may enhance the attractive and elucidative aspects of printed materials.

In this paper, we provided a holistic view of using QR codes in education system, especially in Project Based Learning. We demonstrated five project activities where the teacher can easily apply QR codes. We believe that QR codes have great potential in education. Some possibilities are demonstrated in this paper and there are many creative ideas waiting for us to explore. Also, this paper can be served as a teaching model and it might inspire educators to investigate this exciting topic of mobile learning.

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