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PROFESSIONAL COMPETENCE OF FUTURE SPECIALISTS IN INFORMATION AND COMMUNICATION TECHNOLOGIES: QR CODING IN STUDENT LEARNING

The article explores modern information and telecommunication technologies, which are the basis of information processes in education. The fundamentals of improving the quality of student training from the point of view of the development of a vocational education system are investigated. The authors explore the definition of an innovative educational environment. It is proved that professional IT education is the basis for improving its quality level and has certain advantages over other types of knowledge, providing flexibility due to modern technological features, including the use of QR coding information.

Keywords: pedagogical innovations, information technologies, software tools, QR coding, innovative teaching methods, applied software.

Introduction

Modern society challenges the university to prepare an active and responsible graduate who can subsequently be competent in all its fields: science, education, economics, politics, etc.

This becomes possible only if the student wants to gain new knowledge, to make any there were new discoveries for himself, to know the world. On the way to this, it is impossible to do without the means of new, more interesting for students, teaching methods, modern educational technologies.

If you make a portrait of a modern student, you can see that more and more life of modern applicants is occupied by new technologies. He brings a telephone, laptop or tablet to the school. Thus, we can say that the student is progressive and has access to any information from world sources through his gadgets [1-3].

Today, the IT sphere is very well developed, but not always new technologies can interact with the university, because they imply a high level of teacher training, as well as considerable financial investments. However, many universities currently use digital laboratories, projectors, interactive whiteboards, and much more.

A very common conclusion is that phones in the classroom interfere and distract the student from his educational activities. But as already mentioned, in the modern world it will be hard to do without mobile and computer devices. That is why it is necessary to combine, engage students in educational cognitive activities using their smartphones.

Recently, a QR code has been actively used in the process of preparing students. The abbreviation QR (quick response) in translation from English means "fast response". This is a two-dimensional bar code (matrix code), which was developed by the Japanese company "Denso Wave" in 1994.

It allows you to place 2953 bytes of information in one small square, that is, 7089 digits or 4296 letters (about 1-2 pages of text in A4 format), 1817 characters [3-5].

A QR code allows you to quickly encode and read (decode): texts, URLs of various sites, active links for

downloading information, advertising, etc. Using QR code, information is much larger than that of a conventional bar code, and for decoding, personal devices of students with an installed code reading program can be used, which greatly facilitates work in an audience where there are not enough computers (Fig. 1).

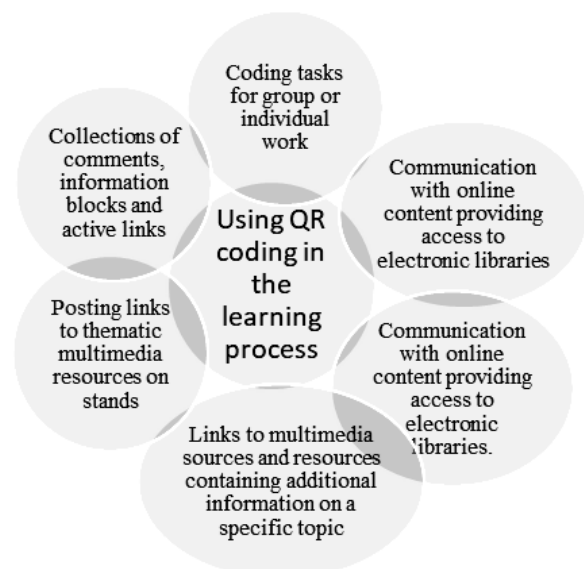


Fig. 1. QR coding in the learning process

Main part

To create a QR code, you need a generator that is available online, which is easy to use and does not require any special knowledge. To do this, there are many free resources in the public domain (Fig. 2).

The most popular code reading and decoding programs for mobile phones are:

1. I-nigma - already mentioned this program, which exists for different mobile platforms.
2. Barcodes Scanner is a popular application that exists in variations for Android and Ios.
3. QuickMark - suitable for almost any mobile device.
4. BeeTagg - another universal program for scanning and recognizing a QR code, suitable for a huge number of mobile phone models.

5. UpCode - again a multi-platform scanner and decoder.

6. Neo Reader - well, you get the idea.

7. Decrypt the QR code yourself - an article on Habrice on how to do without reading programs.

Online services to help decrypt any code:

1. ZXing Decoder Online. It works simply: you are prompted to specify the URL of the image with a QR code that is located on the Internet or download it from your computer. After you click the "Submit" button, a page with decryption results will open.

2. Qr.foxtools.ru. Choose the decryption option and get two options for downloading pictures from bar-code.

3. BarCapture. The desktop is a program that has the same features (Fig. 3).

QR technologies can initiate students' project activities. The group is divided into mini-groups of 4-5 people, and each group receives its own QR code with reference to certain information. Each group scans QR codes and reads the received text, highlighting the main idea of the text, the essence and necessity of the study, the reasons for the success of the innovation and its future prospects.

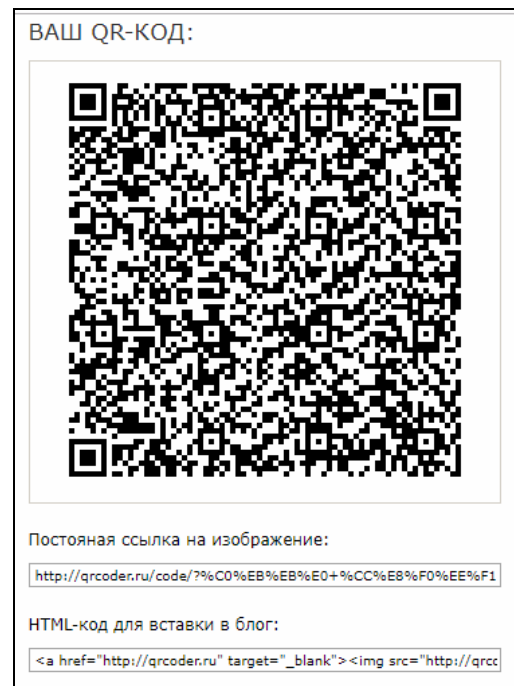


Fig. 2. Generated QR code of the article title.

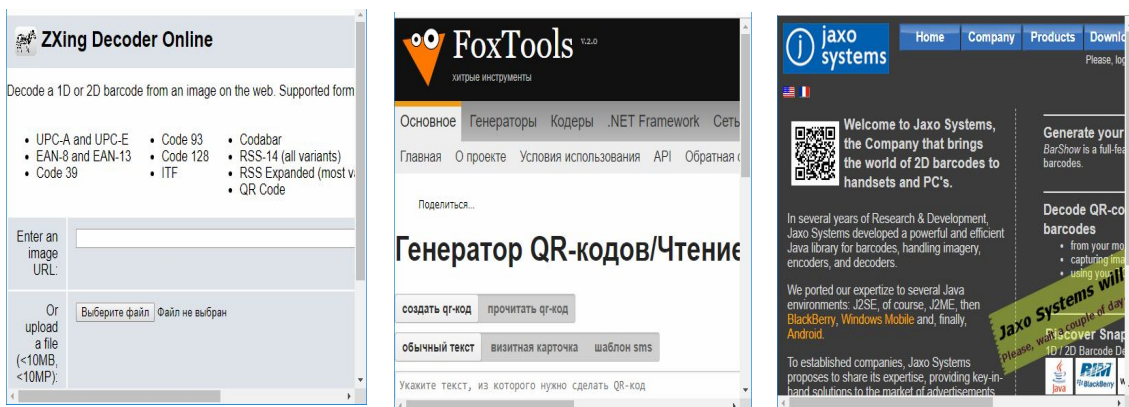


Fig. 3. Online QR code decryption services

Each group also needs to argue its position on this issue. Then there is a change of groups: in a new group, 1 or 2 students from each previous group are combined, that is, in a newly formed group, each student owns information only in its own text. During the discussion, each presents information on his own text, answering the questions that arise, then the information is analyzed and an oral or written statement is written on a given topic.

The next interesting methodological technique that stimulates the internal motivation of students and generates cognitive skills is the use of a QR code to create educational posters.

So, for example, it's easier to generate a QR code to create a task of this kind:

Topic: «Formation of professional competence of future specialists in information and communication technologies». Task: prepare a Professional Case (according to the topic of the variant according to the sample), which should include:

1) introduction (identification, selection and problem solving);

2) general knowledge or information (taking into account the principle of cross-curriculum);

3) description of the problem (situation, history);

4) conclusions (formulation of questions, tasks, etc., forecasting awareness on the issues);

5) package of information materials (video, audio materials, materials on electronic media links to Internet resources, etc.): advertising video (video, presentation)

6) conclusions.

The figure shows the generated QR code of this job (Fig. 4).

For example, earlier in the design of course projects, stamps were widely used, the contents of which were: the name of the discipline, the topic of the project, the author of the project, page number.

Now this information can be encoded using QR code. This will save time, paper and complicate the process of copying information without the permission of its author. It is also possible to use a QR code to encrypt the results of examinations, course projects, and even graduate qualification works of bachelors and masters.



Fig. 4. Generated QR code of the task

So, for example, it can also be used in self-testing, when the answers are encrypted in QR codes that are added to documents and handouts or presented on the blackboard before the lesson, as well as in additional tasks that allow some students to complete tasks of increased complexity

Conclusions

The use of this technology has a very wide range of applications, which is why it arose relatively recently. Nowadays, when the use of other people's developments, both scientific, methodical, and any other nature is becoming more common, it is necessary to apply additional measures to combat plagiarism and other negative consequences, especially during the rapid development of information and telecommunication technologies. The relevance of this research topic is undeniable. Developments in this field of application of information technologies are constantly appearing in the field of student education and improve the quality of professional education at universities.

REFERENCES

1. Hafiak A. Information technology as a component of improving the training quality future specialists in higher education institutions / Hafiak A., Yastreba S., Nosach O., Borodina E. I // Системи управління, навігації та зв'язку. – 2019 – Вип. 2(54). – С. 60–65. – doi: 10.26906/SUNZ.2019.2.060
2. About the Concept of the National Program of Informatization: Law of Ukraine from 04.02.1998 № 75/98-BP // Verkhovna Rada of Ukraine. – 1998, № 27–28, Art. 182
3. E. Borodina Areas of application programming languages python and ruby / Borodina E.A., Alyoshin S.P., Hafiak A.M., Smislov S.O., Sapsay E.V. // Modern engineering and innovative technologies. Issue 7. Part 3. Sergeieva&Co LuBstr. 13 76227 Karlsruhe, Germany – P. 74- 77. DOI: 10.30890/2567-5273.2019-07-03-050
4. A. Hafiak A. Application of genetic programming tools as a means of solving optimization problems/ A. Hafiak, E. Borodina, A. Diachenko-Bohun // Системи управління, навігації та зв'язку. – 2018 – Вип. 6(52). – С. 58–60. – doi: 10.26906/SUNZ.2018.6.058
5. S.P. Alyoshin Developing q-orca site backend using various python programming language libraries. / Alyoshin S.P., Borodina E.A., Hafiak A.M., Zhabran I.B., Kikot A.S. // Modern engineering and innovative technologies. Issue 7. Part 3. Sergeieva&Co LuBstr. 13 76227 Karlsruhe, Germany – P. 48- 53. DOI: 10.30890/2567-5273.2019-07-03-021

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Профессиональная компетентность будущих специалистов по информационно-коммуникационным технологиям: использование QR-кодирования в процессе обучения студентов

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В статье исследуются современные информационные и телекоммуникационные технологии, которые являются основой информационных процессов в образовании. Исследованы основы повышения качества подготовки студентов с точки зрения развития системы профессионального образования. Авторы исследуют определение инновационной образовательной среды. Обосновано, что профессиональное ИТ образование является основой повышения уровня его качества и имеет определенные преимущества по сравнению с другими видами знаний, обеспечивая гибкость за счет современных технологических особенностей, в том числе использование QR-кодирования информации.

Ключевые слова: педагогические инновации, информационные технологии, программные средства, QR-кодирование, инновационные методы обучения, прикладное программное обеспечение.

Професійна компетентність майбутніх фахівців з інформаційно-комунікаційних технологій: використання QR-кодування в процесі навчання студентів

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У статті досліджуються сучасні інформаційні і телекомунікаційні технології, які є основою інформаційних процесів в освіті. Досліджено основи підвищення якості підготовки студентів з точки зору розвитку системи професійної освіти. Автори досліджують визначення інноваційного освітнього середовища. Обґрунтовано, що професійне ІТ освіта є основою підвищення рівня його якості і має певні переваги в порівнянні з іншими видами знань, забезпечуючи гнучкість за рахунок сучасних технологічних особливостей, зокрема використання QR-кодування інформації.

Ключові слова: педагогічні інновації, інформаційні технології, програмні засоби, QR-кодування, інноваційні методи навчання, прикладне програмне забезпечення.