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**Просвирнина И.Б.**

Гродненский государственный университет им. Янки Купалы

Гродно, Беларусь

*i.prosvirnina@grsu.by*

**ЦИФРОВАЯ ЭПОХА И ОБРАЗОВАНИЕ: ПРОБЛЕМЫ, РЕШЕНИЯ, ПЕРСПЕКТИВЫ**

***Аннотация****: Автор данной статьи анализирует опыт преподавания дисциплин «Криптографические методы» для студентов 3-го курса специальности «Компьютерная безопасность (математические методы и программные системы)» и «Информационные ресурсы» для студентов 2-го курса специальности «Управление информационными ресурсами» с использованием информационно-коммуникативных технологий; изучает мнение студентов об обучении в режиме онлайн; ставит и описывает учебно-методический эксперимент, состоящий в тестовой работе с элементами «Семинар» и «Вики» образовательного портала Гродненского государственного университета имени Янки Купалы, с целью повышения качества преподавания университетских дисциплин в цифровом формате.*

***Ключевые слова****: информационно-коммуникативные технологии, технология проведения вебинара, метапознание, приоритеты в преподавании, качество преподавания, образовательный портал, учебно-методический эксперимент, модуль «Семинар», модуль «Вики».*

**Prosvirnina I.**

Yanka Kupala Grodno State University

Grodno, Belarus

*i.prosvirnina@grsu.by*

**THE DIGITAL AGE AND EDUCATION: PROBLEMS, SOLUTIONS, PERSPECTIVES**

***Abstract****: The author of this article analyzes the experience of teaching disciplines “Cryptographic Methods” for the 3rd year students of specialty “Cyber Security (Mathematical Methods and Software Systems)” and “Information Resources” for the 2nd year students of specialty “Information Resource Management” using information and communication technology; studies students' opinion about online learning; sets and describes the educational-methodical experiment, consisting of test work with the elements “Seminar” and “Wiki” of the educational portal of the Yanka Kupala Grodno State University, in order to improve the quality of teaching university disciplines in digital format.*

***Keywords****: information and communication technologies, webinar technology, metacognition, priorities in teaching, quality of teaching, educational portal, educational and methodical experiment, module “Seminar”, module “Wiki”.*

**Introduction**

The target audience of this article is students of the Faculty of Mathematics and Computer Science of Yanka Kupala State University of Grodno. The task of the author is to analyze the experience in teaching the disciplines "Cryptographic Methods" for the 3rd year students of specialty "Cyber Security (Mathematical Methods and Software Systems)" and "Information Resources" for the 2nd year students of specialty "Management of Information Resources" using information and communication technologies; study of students' opinions about learning online; description of the educational and methodological experiment, consisting in test work with the elements "Seminar" and "Wiki" of the Yanka Kupala State University educational portal, in order to improve the quality of teaching the subjects in digital format.

The natural course of events demanded from the university community a change in approaches to teaching and transition to a digital format. This had to be done in a short time. I set myself a task of making this transition without changing my teaching priorities (they will be discussed later). Assessing the current situation, I cannot but recall my impression from the lecture of the famous scientist-historian Lev Nikolaevich Gumilyov. In the distant eighties of the last century, when I was a postgraduate student of the Faculty of Mathematics and Mechanics of Leningrad State University, I attended a lecture by L.N. Gumilyov "Ethnogenesis and the biosphere of the earth", which he read as part of the lecture hall of the Physics Department of Leningrad State University. Undoubtedly, this was an extraordinary event in the scientific life of all faculties of Leningrad State University in Old Peterhof. The lecture made a strong impression on me, although the views of L.N. Gumilyov went beyond the generally accepted ideas about the course of the historical process and were distinguished by their originality. The lecture emphasized, in particular, the role of natural causes in the development of mankind. Extrapolating these ideas to the current situation, I note that nature throws down another challenge to us, and everyone in their place should try to overcome difficulties, armed with the experience accumulated by humanity, in particular, should learn to use digital technologies in their field of activity.

If we turn to teaching, then natural questions arise: is the Internet a panacea and how to skillfully apply information and communication technologies in the educational process? For me, the answer to the first question is unambiguous: of course not! The student needs help to deal with the avalanche of information that has befallen him. And this requires a nearby highly educated teacher who is constantly learning himself, including learning how to teach others. As for information and communication technologies, this is also not a panacea, but a delicate toolkit that helps in teaching and requires appropriate skills when using it.

This article will discuss my views on teaching priorities and how to implement them with the help of information and communication technologies. But first things first.

**Teaching priorities and the use of information and communication technologies**

I'll start by thinking about metacognition. I share the methodology behind the teaching approach in the famous Head First textbook series [1]. The essence of this technique is as follows. Our brain is constantly waiting for new experiences. It seeks, analyzes, expects something unusual. On the other hand, the brain does its best to isolate itself from the routine so that it does not interfere with its real work $-$ the preservation of what is really important to it. Boring, routine information does not pass the filter and is cut off as irrelevant.

The brain learns what is important to it if it is made to work in the perception and assessment of information. And in order to achieve this, you need to force the people you teach to actively participate in the learning process. Students should be interested in the result, constantly solving problems, formulating conclusions, conducting discussions with each other and with the teacher, learning to work in a team.

The teacher must attract and retain the attention of students, remembering that the brain pays attention to the interesting, attractive, unexpected, and our ability to memorize depends largely on emotional empathy. We remember how we feel. We are talking about such emotions as surprise, curiosity, interest and feeling: "I figured out myself how to solve this problem!" To remember and assimilate the material, you must first understand it through your own experience in solving a particular problem.

One of the ways to implement this technique is the project-based teaching method. The purpose of the project method is to independently acquire knowledge in the process of solving problems. The project method is based on the development of students' cognitive skills, the ability to independently construct their knowledge, to navigate the information space.

Are these teaching priorities compatible with the use of information and communication technologies? Three years ago, after conducting a series of webinars on the WebEx platform for students of the Faculty of Mathematics and Informatics of various specialties and teachers of the Grodno region, I was surprised to find that yes, they are compatible. In my work [2], the combination of web technologies with teaching technologies based on interactive principles of interaction, practice-oriented approach and the project method is described and analyzed as a popular, convenient and effective way to obtain new information and improve the level of pedagogical skills of teachers.

**Technologies for using the educational portal and WebEx platform when teaching the disciplines "Cryptographic Methods" and "Information Resources"**

Let's start with the discipline "Cryptographic Methods". Lectures, laboratory and practical exercises were conducted on the WebEx platform, with the active use of the educational portal: absolutely all presentations of lectures, laboratory and practical exercises were posted on the portal.

Lectures, laboratory and practical exercises of the discipline "Information Resources" were also conducted on the WebEx platform using the portal. The same opportunities were used as when teaching the course "Cryptographic Methods". In addition, the joint viewing of the analyzed sites was widely used, and with the help of the portal element "Assignment" the students handed over to the teacher by a certain date a presentation on the proposed topic. The instructor checked the presentations, saved them and put them on the desktop for the next lab lesson. Each of the students presented their work, the work was discussed in a webinar mode, and the teacher gave a grade. It was also practiced to create tests jointly with students on a selected topic for their subsequent implementation by the whole group. Students also sent questions to the tests through the “Assignment” element, and the teacher prepared the general test using the WebEx Poll Questionnaire Editor.

**Studying the opinion of 2nd year students of the specialty "Information Resources Management" and 3rd year students of the specialty "Computer Security (Mathematical Methods and Software Systems)" about online learning**

After completing the courses "Information Resources" and "Cryptographic Methods", I was tasked with getting students' feedback on the online learning process in these disciplines. On the educational portal in the section "Auxiliary block" a questionnaire was published using the element "Assignment".

It was important to know what students liked and what did not like in the process of teaching disciplines; what I need to pay attention to make learning more effective.

Here are some excerpts from the survey results.

1. Is it convenient for you to study remotely?

All students participating in the survey answered this question: "Yes, it is convenient"

2. Are you satisfied with the online learning process?

9% of students participating in the survey answered: "More likely no than yes"

36% of students participating in the survey answered: "Yes"

55% of students participating in the survey answered: "More likely yes than no"

3. What training mode is most acceptable for you?

64% of students participating in the survey answered: "Combination of online and offline modes"

36% of students participating in the survey answered: "Online training"

4. How do you assess the teacher's work in the online learning mode? The answer is given in free form.

Here are some excerpts from the students' answers.

Olga Klusevich: “I appreciate your work only positively, you didn’t let the students get distracted and bored.”

Kolodko Ekaterina: “Satisfactory. Interesting organization of the educational process, the opportunity to express oneself both individually and in teams, the provision of creative tasks"

Trusevich Evita: “The transition to the online learning mode did not affect the quality of knowledge acquisition.

This course (we are talking about the course "Information Resources") presents informative educational material, as close as possible to the most urgent tasks of practical activity. The presentation of the material was carried out at an optimal pace for perception, as well as at the desired sound level.

An open discussion of various ways and methods of solving the problem posed made it possible to extract useful additional information for oneself.

The willingness to help and re-explain problematic points made me feel supported and involved by the teacher, which is undoubtedly a positive factor in creating a favorable classroom atmosphere.

Thanks to the thoughtful and visual presentation of topics (in the form of presentations, as well as the wide use of links to external training, information, software and other resources), the course turned out to be very informative and exciting.

High learning efficiency thanks to the use of convenient tools. First of all, these are presentations, videos, chat, tests, screening.

Online learning technology turned out to be very convenient.

The Internet offers teachers and students to communicate in completely different formats, unlimited by nothing, except for technological capabilities.

Online training provides an opportunity to get acquainted with new technologies and practice systems for organizing web conferencing"

**Description of the educational-methodical experiment, consisting in test work with the elements "Seminar" and "Wiki" of the educational portal of Yanka Kupala State University**

In the questionnaire with which the students of specialty "Information Resources Management" worked, the question was asked: "Do you agree to take part in an educational and methodological experiment to develop skills in working with the elements "Seminar" and "Wiki" available on the educational portal of Yanka Kupala State University?

a. Yes.

b. No.

In case of a positive answer, I suggested that the volunteers go to the educational portal in the course "Information Resources" in the section "Auxiliary block" and select the subsection "Practicing skills in working with the element" Seminar", where the algorithm for further work was indicated.

Three volunteers took part in the educational-methodical experiment: Daria Kozlova, Alexandra Povazhnaya, Evita Trusevich.

The purpose of the experiment was to practice the skills of using the elements "Seminar" and "Wiki", available on the educational portal, to apply these elements in the teaching process.

When working with the "Seminar" element, students were asked to write an essay on the topic: "Computer games: pros and cons" and evaluate an essay on the same topic by two of their classmates.

The work with the "Seminar" module was divided into two stages. Students sent out essays first. After that, each participant in the experiment assessed the work of two classmates according to the criteria: completeness of the topic, originality of judgments, creative approach to the disclosure of the topic, style of presentation; wrote a review on the work in the "Review" block and sent it. The teacher monitored all stages of the process in an online format and evaluated the actions of the students.

The next stage of the educational and methodological experiment was to develop the skills of using the "Wiki" element.

In the "Wiki Description" field, students were given an assignment and their work was planned:

"Write an essay on "The history of the development of social networks on the Internet"

It was proposed to work according to the following plan.

1) Daria Kozlova will publish an already written essay on this topic.

2) Evita Trusevich will add her own materials.

3) Sasha Povazhnaya will write a general conclusion"

The teacher had the opportunity to follow the process of writing essays, the personal contribution of each and evaluate the work of students.

Conclusions on the conducted educational and methodological experiment:

1. The modules of the portal "Seminar" and "Wiki" have proven themselves well as tools for working in groups online.

2. Students did not have any problems in completing assignments.

3. The use of the portal modules "Seminar" and "Wiki" contributed to the coordination of the team and allowed to evaluate the work in a variety of ways.

**Conclusion**

Evaluating the work with 3rd year students of the specialty "Computer Security (Mathematical Methods and Software Systems)" and 2nd year students of the specialty "Information Resource Management" using information and communication technologies, one can come to the following conclusion. A skillful combination of web technologies with teaching priorities based on a practice-oriented approach and a project-based teaching method is a popular, convenient and effective way of teaching the disciplines "Cryptographic Methods" and "Information Resources"

There is a lot of work ahead to introduce new elements of information and communication technologies into the educational process, in particular, the Seminar and Wiki modules (The educational and methodological experiment on the use of these modules was successful).

From the point of view of the author of the article, it is also important that the students noted the effectiveness of teaching using information and communication technologies, appreciated the opportunity provided to them to get acquainted with new technologies and practice systems for organizing web conferences, and also expressed the opinion that online technologies were very convenient in the process of teaching university disciplines.

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