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Roman S. Gurevych

Full member (academician) of the National Academy of Educational Sciences of Ukraine, Professor, Doctor of Pedagogical Sciences, Director of the Education and Scientific Institute of Pedagogy, Psychology, Training of Specialists of Higher Qualification

Vinnitsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnitsia, Ukraine

ORCIDID 0000-0003-1304-3870

rom.shahin@gmail.com

Iryna Yu. Shakhina

PhD of Pedagogical Sciences, Associate Professor at the

Department of Innovation and Information Technologies in Education

Vinnitsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnitsia, Ukraine

ORCIDID 0000-0002-4318-6189

rom.shahin@gmail.com

Olena A. Podzygun

PhD of Pedagogical Sciences, Associate Professor at the

Department of Teaching Methods of Foreign Languages

Vinnitsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnitsia, Ukraine

podzygun77@gmail.com

GOOGLE CLASSROOM AS AN EFFECTIVE TOOL OF SMART LEARNING AND MONITORING OF STUDENTS' KNOWLEDGE IN VOCATIONAL SCHOOLS

Abstract. The paper highlights the importance of monitoring students' knowledge in the educational process organized on the basis of IT. The monitoring procedure in training enhances students' knowledge. The results of this study show that the modernization of the monitoring in the educational process requires the use of modern computer equipment and means of communication. Electronic monitoring of students' knowledge is the basis for obtaining an objective independent assessment of the level of students' academic achievements (knowledge, intellectual and practical skills). The paper also presents the list of online services for creating broad-based tests, which include Google Forms, LEARNINGAPPS.ORG, PROPROFS, ClassMarker.

Careful analysis of the learning forms allows us to present a way of organizing students' training with the help of the Google platform, including the Google Classroom service (Learning Management System), which is essential for online learning and effective control of students' knowledge of the subjects of their major. Unlike its predecessors, the Google Classroom as a separate learning management system allows teachers to use the integrated tools of the Google Apps package, such as Google Drive and Gmail. The main possibilities of using Google Classroom for the organization of Smart learning and monitoring of students' knowledge are identified. The paper also presents detailed information on the possibilities for Google Classroom users (teachers, students, mentors, parents, administrators).

The use of the Smart course, developed by means of the interactive services combined with the traditional methods of teaching information technologies, has made it possible to move the communication of students and teachers up to a new level – it is not limited only to a classroom. In the Google Classroom the educators can post tasks, send announcements, start discussions, and students can share materials, add comments on the course, communicate via e-mail. The information on the work done is constantly updated, which allows the educators to check the tasks quickly and monitor students' knowledge.

The article proves the effectiveness of using the Smart course on the basis of Google Classroom for the formation of information skills of students majoring in “Information and Software Processing Operator”.

Keywords: on-line learning; Google Classroom; Smart course; Smart technologies; Smart learning.

1. INTRODUCTION

Problem statement. Rapid informatization of education encourages many scholars, educators as well as researchers to look for the new ways to improve intellectual abilities of a person, which results in drafting quite different requirements for the development of students' cognitive activity. The organization of the educational process, on whichever educational technology it is based, requires control of the level of knowledge acquisition. The procedure of knowledge control in education ensures the achievement of the proper level of students' knowledge. This is deemed possible with the implementation of Smart-technologies in the educational process.

The Google Classroom service, which was recently introduced by Google and developed on the basis of Google Apps – Learning Management System (LMS), deserves a particular attention. The most well-known example of LMS is Moodle, but for most users it is quite complicated and not very easy to use [1].

Unlike Moodle, Google Classroom allows educators to use Google Apps' integrated tools, such as Google Drive and Gmail, which in this case form a separate learning management system [2].

Currently, a large number of programs and various distance learning courses have a linear structure that limits the choice of pace and sequence of assignments. But ensuring the individualization of learning without special tools can be time-consuming for the educator. The use of Google Classroom and similar tools simplifies individualization of the educational process and helps to monitor students' knowledge during distance learning.

Analysis of recent research and publications. The idea of using cloud technologies in education is being widely discussed in scientific and pedagogical literature. In particular, the problems of the use of cloud technologies in the educational process are studied by Ukrainian researchers V. Bykov [3], Zh. Bilijchuk [4], R. Gurevych [5], O. Glazunova [6], V. Grycenko [2], M. Kademiya [5], V. Korolchuk [6], O. Kuzminska [7], S. Lytvynova [8], B. Maliczkyj [9], O. Markova [10], N. Morze [7], V. Oleksyuk [11], O. Pinchuk [12], S. Semerikov [10], O. Spirin [12], A. Stryuk [10], Yu. Tryus [13], T. Vakalyuk [14], T. Voloshina [6] as well as the foreign authors M. Armbrus, L.E. Buchanan, A. Lane, T. Liyoshi, A. Nijholt, S. Kajita [18], V. Kumar, A. Fox, R. Griffith, K. Subramanian, N. Sultan. The analysis of these studies shows that the exponential growth of information in virtually all branches of knowledge requires the application of new approaches to the pedagogical process [15, p.143]. The scientists consider the issues relating to the general theory of using cloud technology in education, the development of tests and organization of testing on the basis of cloud environments, the deployment of cloud-based teacher's rooms, the prospects for the development of cloud-based software tools for the creation of an electronic library, the creation of educational resources in Moodle [16] and more.

The Ukrainian educators have also developed a "Learn from Google" community where educators can share experience in using Google Classroom [17]. The "Classroom" project was created at Nagoya University and is a modern overall computing environment for creating educational programs. In the project the contextual data is used to provide optimized learning information through the web interface [18].

Consequently, as it is clearly explained by V. Bykov, O. Spirin and O. Pinchuk, such a computing environment should be formed on new technologies and provide educational process with electronic textbooks, electronic courseware packages, guidelines for the use of various web and cloud services, broadband Internet, as well as create the conditions for the introduction of pedagogically weighed teaching models, use of cloud- and mobile oriented learning environments for the development of students' key competencies and life important skills, use of various virtual and research laboratories, for the realization of students' personal

abilities, monitoring of personal and educational achievements, taking into account the needs of informatization in every educational institution [12, p. 193].

A similar idea was offered earlier by V. Bykov, who argues that in accordance with the concept of cloud computing due to the special user interface, supported by the system software network configuration, the network virtual information and communication objects are formed in the adaptive information and communication networks. Such objects are network virtual platforms as a situational component of the logical network infrastructure of information and communication networks with a temporary open flexible architecture, which, according to its structure and the time of its existence, corresponds to the personalized needs of a user (an individual and a group), and their formation and use are supported by cloud computing technologies [3, p. 4].

Unresolved aspects of the problem. The modern world is characterized by a state of constant systemic global change. The role of information communications, products and services in the socio-economic and cultural life of humankind is growing. The breakthrough in the development of information and communication technologies has identified deep, meaningful transformations in all spheres of human life, including education. Educational technologies that correspond to outdated technological systems and industrial society are based on the so-called academic system of education, tuned to the requirements of the labor market, within which knowledge is transferred in the classroom, in lessons, and an educator performs the functions of knowledge transferring, control and assessment of learning outcomes. Such a system is no longer able to meet current educational requirements; the answer to modern challenges is Smart learning.

Many issues of using Smart technologies remain poorly understood, and this, in turn, leads to a number of unresolved problems related to high-quality specialist training, one of which is the use of learning management systems such as Google Classroom. The identification of the features of effective professional development, generalization of best practices along with thorough analysis of modern software revealed contradictions between the society's demand for highly competent specialists and the current level of their training.

The aim of this article is to identify the key features of using Google Classroom to organize teaching process and monitor students' knowledge.

Therefore, with a view to provide adaptability, time and resource saving, productive communication, integration with popular services, accessibility and security we have developed a Smart course "Adobe Illustrator | VECTOR GRAPHICS", which is for the first time presented in Google Classroom environment. This ensures an efficient educational process by engaging students in learning activities, providing an opportunity for reflective teaching on the one hand and facilitative comprehension on the other, thus developing the core professional competencies of the educational process participants.

2. RESULTS OF THE STUDY

Modernization of the monitoring of the educational process requires modern computer technology and communications. Conducting electronic monitoring of students' knowledge is the basis for obtaining an objective independent assessment of the level of students' academic achievement (knowledge, intellectual skills and practical skills).

Monitoring is seen as a process of learning management being at the same time an integral part of the educational process, whereas testing is a procedure for establishing the fact whether a student comprehends the learning material or not [19, p. 153].

It should be noted that electronic monitoring has an essential list of advantages over the traditional form of knowledge quality control, especially for educators:

- it provides an opportunity to quickly check the knowledge of a large number of students on different topics at a time;
- it relieves educators of routine work and organization of mass control, and therefore gives them more time to improve their professional competence;
- it increases the efficiency of individual work with students, which is one of the main components in modern education, since the student receives a third of knowledge independently.

Along with the advantages we should also note a number of disadvantages that the electronic monitoring has, which are:

- students have less possibility to personally communicate with teachers;
- standardized thinking where the level of personality development is neglected;
- labor-intensiveness of the process (the development of test packages takes a lot of time).

Computer testing refers to an adapted pedagogical testing model. This model is based on the classic model taking into account the complexity of tasks. In computer testing, the tasks are sequentially displayed on the computer screen, and the level of student's knowledge is evaluated right after a student completes an assignment.

There is a number of software and Internet services which allow creating tests for broad purposes. Here are some of them [19, p. 154-155]:

- Google Forms are one of the quickest and easiest ways to create a task or a test (an educator needs to write a task and choose a response type).
- LEARNINGAPPS.ORG is a free on-line service that allows educators to save created applications (educational material can be created by the educators and published for other users with the help of ready-made templates).
- PROPROFS allows an educator to create tests of any kind (the educator can offer one or more options, fill in the missing word or write a detailed answer). The tool allows educators to add text documents and presentations, PDF files, as well as images, audio and video files to the assignments. After completing a test, an educator can leave it available on the Proprofs website or embed on the web page the educator has on the Internet.
- ClassMarker allows the educator to do testing with different response formats (in addition to the usual options, even an essay is available). To begin with, the educator needs to create a virtual class and send invitation codes to the students. ClassMarker keeps the results of all tests performed, keeping statistics of the progress. Educators can also embed the test tasks on the webpage.

The disadvantage of the above services is that they are only individual test creating sites, and a separate platform is required for organizing and describing test content and various usage instructions to implement and display tests. Therefore, educators can use the Google Classroom service created on the Google platform that integrates with other popular Google services, while having built-in functions for testing students.

Google Classroom is a free service for educational institutions and non-profit organizations. It is also available to anyone with a personal Google account. The communication between students and educators moves up to a new level through Google Classroom, – it is now not limited to only a classroom.

Let's emphasize the advantages of using Google Classroom in teaching:

Easy setup. Educators can arrange for courses, invite students and other educators. It is convenient to publish tasks, announcements and questions on the course.

Saves time and paper. Educators can plan the educational process, create courses, assign tasks and communicate with students in one app.

Convenience. Students can view tasks on the course calendar, or on the To-Do list page. All content is automatically added to folders in Google Drive.

Adaptability. There is a possibility to customize the environment for each student or educator separately: from the interface language to the way of displaying the educational environment itself.

Productive communication. In Google Classroom educators can post tasks, send announcements and start discussions, and students can share content, add comments and communicate by email. The information on the performed work is constantly updated, which allows the educators to check the tasks quickly, post ratings and add comments.

Integration with popular services. In Google Classroom educators can work with Google Docs, Calendar, Gmail, Drive, and Forms.

Affordable and secure. Google Classroom is a free service. There are no ads in it, and materials and information about the students are not used for marketing purposes.

It is worth noting that saving time in Google Classroom is realized as follows:

Add students easily. Students can join the courses using the code.

Work with several courses. Educators can use announcements, tasks and questions from other courses, send records at once to several courses, download course files and archive them.

Shared teaching. There is a possibility to invite up to 20 other educators to the course.

Comfortable templates. Educators can quickly create individual tasks for each student.

A lot of additional materials. Educators can add YouTube videos, Google forms, PDFs and other objects of the Drive to their tasks. In the classroom mobile app, educators and students can draw and add notes as well as choose texts in documents and PDFs.

Task settings. Educators can add deadlines to the tasks, change the scale of assessments and track the tasks checked.

Preliminary preparation. Educators can create drafts of records and tasks or adjust the date and time of their automatic publication in the course.

Quick questioning. There is a possibility to ask students questions and then view responses directly in the Class without additional services or applications.

Setting up the course topic. There is a possibility to edit color themes and topics by default.

Centralized repository of resources. Educators can create course pages for curriculums, rules and other documents.

Tracking tasks for students. The Classroom creates Google Calendar for each course and updates the tasks and deadlines. Students can view tasks in the stream page, on the task page and in the course calendar.

Tracking tasks for educators. Educators can check students' papers including tasks, questions, grades and previous comments, review the work of one or all courses and sort them by different parameters.

Systematization of courses. It is possible to add topics to records and filter the stream page by records.

Easy rating. Educators can sort students by names and surnames, track the work done, assign pre-ratings and add comments. In addition, it is possible to add abstracts and reviews in the Google Classroom mobile app.

Transfer grades. There is a possibility to export grades in Google Sheets or CSV files that can be downloaded to other applications.

Integration with other tools for educators. It is possible to synchronize Google Classroom with partner apps.

Individual tasks. Educators can publish tasks and announcements for students individually in the course [4].

Above all, we would like to focus our attention on using Smart-technologies in the educational process.

Having reviewed scientific, methodological, and pedagogical literature on the use of Smart technologies, we determined that Smart education is a flexible learning in the interactive educational environment with content from around the world that is freely accessible.

We assume that Smart technologies in education are the technologies that provide a dialogue, that is, the active exchange of messages between the user and the information system in real-time mode.

The importance and necessity of introducing Smart technology into education is justified by international experts and scientists. Smart technologies touch upon all the spheres of human activities, but they probably have the strongest positive impact on education, since they open the door to implementing completely new methods of teaching and learning.

A Smart course is a professionally directed, organized two-way activity that develops the skills of using an unprecedented number of up-to-date on-line tools for obtaining analytical and regulatory information. Information, practical examples and tasks for the course are selected based on the information needs of modern education.

Let's take a closer look at the interactions and collaborative work that becomes possible with the use of Google Classroom in the process of creating a Smart course, which gives a possibility to:

- get a Smart course which is always available online and through the Google Classroom application for Android and iOS;
- view, comment and edit students' work in real-time mode, write summaries to students' work in the Google Classroom mobile app.;
- post announcements, ask students questions and move important topics to the beginning of the line;
- specify persons who can publish records and leave comments in the course, as well as block students individually;
- share links, videos and images quickly from various sites in the Classroom with the help of “Share in Google Classroom”;
- send web pages to students directly using the “Share in Google Classroom”; students can also give the educator access to students' screens;
- invite parents to sign up for electronic documents with information on the assignments to be done by students (the newsletter also includes announcements and questions published by the educator in the course) [9, p. 82].

Another feature of Google Classroom is a convenient support for administrators, which includes:

- *Accessibility and safety.* As with all the other free G Suite for Education services, the Classroom does not have ads, and materials and information about students are not used for marketing purposes.
- *Single Sign-On.* Educators and students can sign in through the G Suite for Education accounts.
- *Permission settings.* Educators can enable or disable the Class for all users of the G Suite for Education, individual units, or other organizational units. In addition, it is possible to specify the educators who will be able to create courses and manage them.
- *Integration with the information system of the educational institution.* Using the Classroom API, educators can create courses and lists of students based on data from the information system of the educational institution.
- *Professional development.* The Google Learning Center has classes for educators who want to work with the Classroom.
- *Free 24-hour support.* The problems, if they occur, may be solved by contacting the 24/7 support or the online help desk.

– *Protection of personal data.* Working with Google Classroom is governed by the terms of use of G Suite for Education, which provides for compliance with the Law on the right to education and privacy.

– *Classroom users' data.* Classroom reports are available in the Admin console [20].

The detailed information about users' possibilities in Google Classroom is presented in Table 1 (based on the materials of Google Company).

Table 1

Possibilities for the Google Classroom users

User category	Possibilities
Educators	<ul style="list-style-type: none"> – creating and managing courses, tasks, and giving grades – effective assigning of grades and comments in real-time mode
Students	<ul style="list-style-type: none"> – tracking activity in the course and obtaining new materials – exchange of information and communication in the course or by e-mail – delivery of completed tasks – getting grades and comments from the educator
Mentors (parents)	<ul style="list-style-type: none"> – receiving letters with information on the student's progress, including information about those works and tasks that a student needs to complete – Note. Students' mentors do not have direct access to the Class. They can subscribe to e-mail via the personal account
Administrators	<ul style="list-style-type: none"> – creating, viewing and deleting any courses in the domain – adding and removing students and educators within the framework of the course – viewing all courses in the domain

In order to verify the possibility of using a Smart course, the experimental study was performed, which was aimed at identifying the level of information skills of students majoring in “Information and Software Processing Operator”. We created the Smart course “Adobe Illustrator | VECTOR GRAPHICS ” in Google Classroom (see Fig.1), which is based on the State Standard of Vocational Education (profession – an information and software operator). The title, sections and topic of the course correspond to the topic “Vector Graphics” in the typical thematic plan for the subject “Fundamentals of Computer Graphics”.

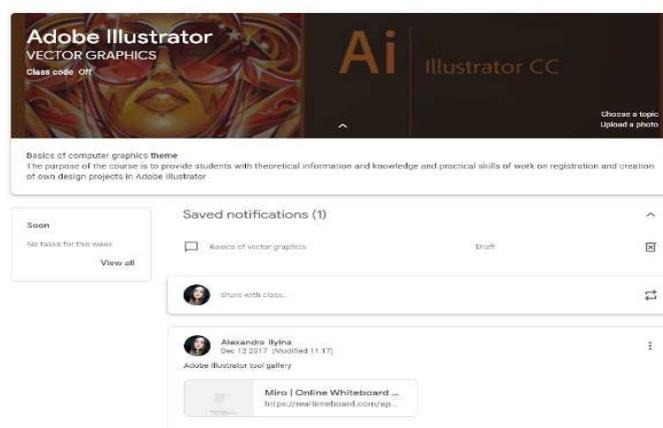


Fig. 1. Smart course “Adobe Illustrator | VECTOR GRAPHICS”

The experimental training was performed at Vinnytsia Interregional Higher Vocational School, Ukraine, with the second-year students of Groups 6 and 7 of the specialty “Information and Software Processing Operator”. The training was introduced during two terms in the 2018-2019 academic year. The students of Group 6 (30 students) studied with the use of the Smart course in Google Classroom; these students formed the experimental group (EG). The course we have developed can be viewed using the code pqqr5k. The students of Group 7 (30 students) were taught with the use of the traditional teaching methods and these students formed the control group (CG).

Cognitive, motivational and operational-activity criteria were used to assess the level of informational skills formation.

The cognitive criterion stands for volume, depth, strength, diversity of knowledge and skills. By the motivational criterion, we understand the interest in the process and results of learning, the attitude to learning process. The operational-activity criterion means the mastering of intellectual operations, learning and research.

According to the criterion approach, the degree of information skills formation was classified into three levels: high, medium and low. On a 100-point scale, the levels were evaluated in the following quantitative ratios: high level is minimum 80 points; medium level is 60-79 points; low level is less than 60 points.

Quantitative results of information skills formation in the control and experimental groups are presented in table 2 and figures 2, 3.

Table 2

The levels of information skills formation in the control and experimental groups, %

№	Information skills	Levels					
		Low		Medium		High	
		CG	EG	CG	EG	CG	EG
1.	Search, selection, systematization (classification) of information	38	37	51	49	11	14
2.	Ability to organize, convert, store and transmit information	52	55	31	30	17	15
3.	Knowledge of ways to compress information	43	41	36	36	21	23
4.	Use of information networks, databases, knowledge bases	27	28	59	53	14	19
5.	Mastery of forms of information presentation	35	34	39	38	26	28

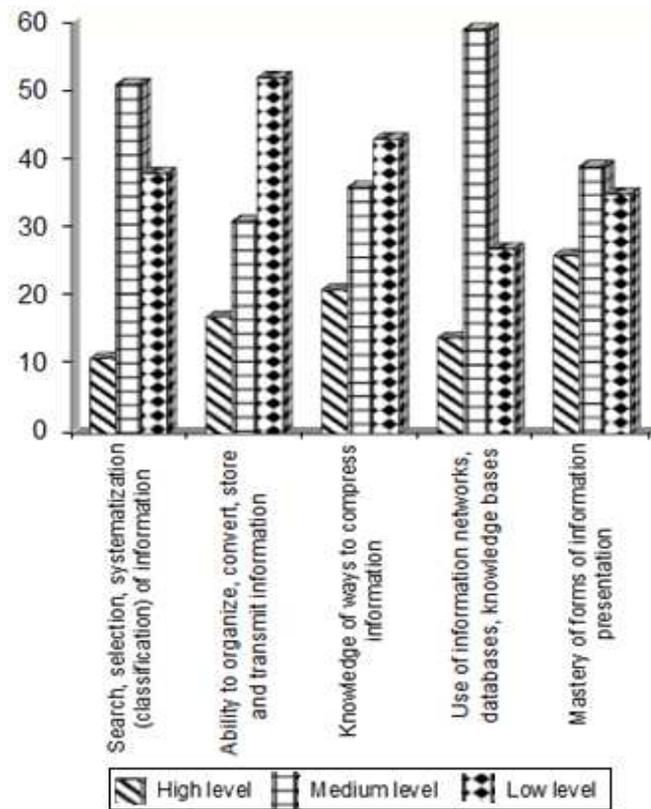


Fig. 2. The levels of information skills formation in the control group

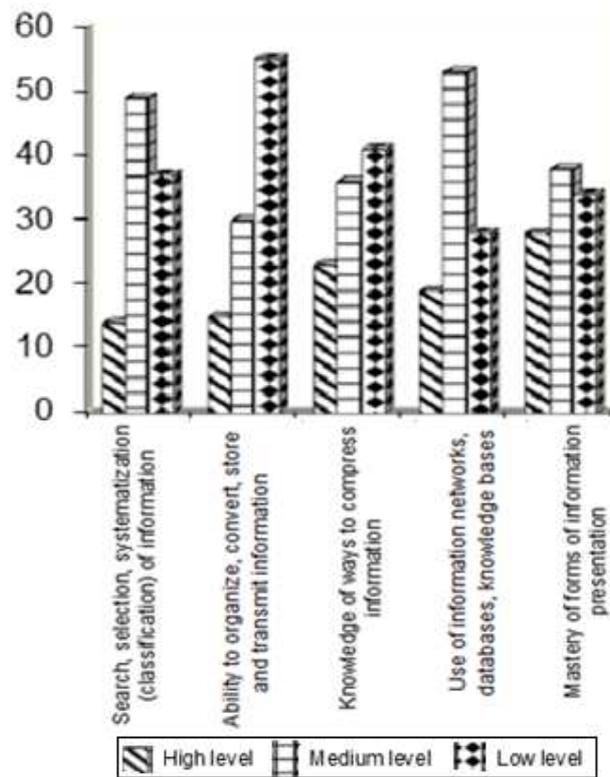


Fig.3. The levels of information skills formation in the experimental group

The experimental study showed that in the experimental and control groups the level of formation of information skills differed significantly. There were statistical changes in the development of professional training of students in the experimental group compared to the control one: the number of students with a high level increased by 15% and the number of students who had a low level at the beginning of the experiment decreased by 17%, while in the control group the low level decreased by only 14% (see Fig. 4, 5).

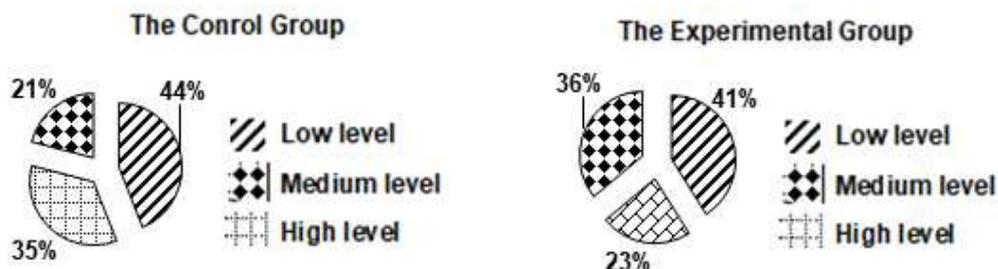


Fig.4. Comparative characteristics of the levels of information skills formation in the control and experimental groups at the beginning of the experimental training

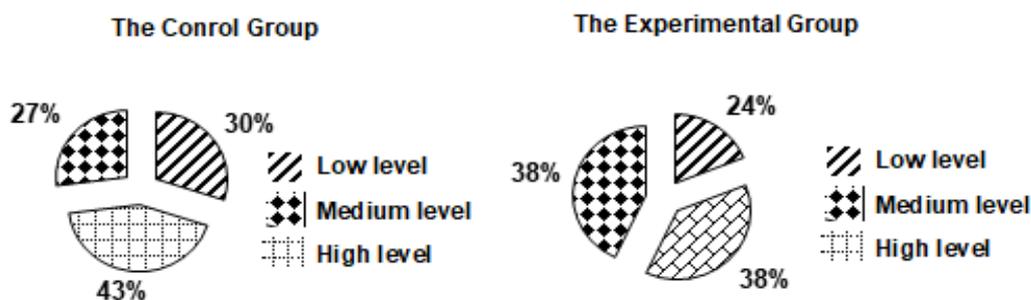


Fig.5. Comparative characteristics of the levels of information skills formation in the control and experimental groups after the experimental training

Thus, the experimental training showed the significant advantages of this methodology, namely: growing interest in educational activities, enhancing skills in the area of electronics, search for information with its further processing enable students to develop as modern mobile specialists. This is where we get students interested in the learning process, they understand how to concentrate on the most significant issues and build interpersonal relationships based on the constant interchange of information.

Having analyzed the experimental outcomes, we came to the conclusion that Google Classroom is an effective tool of Smart learning in modern education. We share the opinion that this service is a unique pedagogical tool in the implementation of ubiquitous learning (u-learning is a lifelong learning technology using information and communication tools in all spheres of social life. To implement u-learning the appropriate educational materials are required that are transferred to mobile devices) [5, p. 75]. Thus, Google Classroom is a prerequisite for the development of a competitive professional, who can embrace cooperation, communication, social responsibility, the ability to think critically and to solve problems quickly. In addition, Google Classroom is extremely easy to use for both educators and students.

3. CONCLUSIONS AND FURTHER RESEARCH PROSPECTS

As a result of the study, we can conclude that using Google Classroom in the process of teaching in vocational education increases teaching quality through the implementation of Smart learning technologies, application of the open educational environment and ensures an effective educational process by involving students in educational activities, enabling them to understand and focus on what they need to know to succeed in their job.

The above allows us to assume that the Google Classroom Learning Management System meets most of the requirements of modern education. The main purpose of using Smart technologies is to create educational environment as a precondition of the development of a competitive specialist, a person with highly developed cooperation and communication skills, social responsibility, the ability to think critically and solve problems promptly. To achieve this, we developed a Smart course in the online service Classroom on the Google platform, which proved to be more productive, fast, efficient and effective, partially due to the integration with other popular services.

The experimental study showed that the use of Google Classroom as an element of Smart learning can improve the educational process, increase students' achievement, encourage their cognitive and educational activities, as well as reorganize the process of learning.

The analysis of the experimental training shows that students have to be competent in using e-mail, cloud and smart technologies, need skills in interactive communication and experience in available online/offline office applications, etc. Therefore, Google Classroom develops the basic informational competencies of all participants of the educational process.

The use of the Smart course, developed by means of the interactive services combined with the traditional methods of teaching information technologies, has made it possible to move the communication of students and educators up to a new level – it is not limited only to a classroom. The information on the work done is constantly updated, which allows the educators to check the tasks quickly and monitor students' knowledge.

Further studies should be focused on quality and efficiency assessment of the information-oriented learning environment in educational institutions of different types, on using smart learning technologies for people with special needs.

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GOOGLE CLASSROOM ЯК ЕФЕКТИВНИЙ ЗАСІБ SMART-НАВЧАННЯ ТА МОНІТОРИНГУ ЗНАНЬ УЧНІВ У ЗАКЛАДАХ ПРОФЕСІЙНО-ТЕХНІЧНОЇ ОСВІТИ

Гуревич Роман Семенович

дійсний член (академік) НАПН України, професор, доктор педагогічних наук, директор Навчально-наукового інституту педагогіки, психології, підготовки фахівців вищої кваліфікації
Вінницький державний педагогічний університет імені Михайла Коцюбинського, м. Вінниця, Україна
gurrom@icloud.com

Шахіна Ірина Юрїївна

кандидат педагогічних наук, доцент
кафедри інноваційних та інформаційних технологій в освіті
Вінницький державний педагогічний університет імені Михайла Коцюбинського, м. Вінниця, Україна
rom.shahin@gmail.com

Подзигун Олена Анатоліївна

кандидат педагогічних наук, доцент
кафедри методики навчання іноземних мов
Вінницький державний педагогічний університет імені Михайла Коцюбинського, м. Вінниця, Україна
podzigun77@gmail.com

Анотація. У статті висвітлено важливу роль контролю рівня знань учнів під час організації навчального процесу на основі освітньої технології. Процедура контролю в процесі навчання виконує функцію забезпечення якісного рівня знань учнів. Установлено, що

модернізація контролю освітнього процесу потребує сучасної комп'ютерної техніки та засобів комунікації. Проведення електронного контролю знань учнів є основою одержання об'єктивної незалежної оцінки рівня навчальних досягнень (знань, інтелектуальних умінь і практичних навичок) учнів. Наголошено, що комп'ютерне тестування належить до адаптивної моделі педагогічного тестування, котре спирається на класичну модель з урахуванням складності завдань. Наведено перелік інтернет-сервісів для створення тестів широкого призначення, а саме: Google Forms, LEARNINGAPPS.ORG, PROPROFS, ClassMarker.

На основі аналізу форм навчання представлено спосіб організації навчання учнів за допомогою платформи Google, зокрема сервісу Google Classroom (система управління навчанням), який є необхідним для забезпечення навчання онлайн та ефективного контролю знань учнів з предметів за спеціальністю. Констатовано, що Google Classroom як окрема система управління навчанням, на відміну від своїх попередників, дозволяє викладачам використовувати інтегровані інструменти пакету Google Apps, наприклад, Google Drive і Gmail. Визначено основні можливості використання Google Classroom для організації Smart-навчання та моніторингу знань студентів. У статті також подано детальну інформацію про можливості окремих користувачів у Google Classroom (викладачів, учнів, кураторів, батьків, адміністраторів).

Розглянуто процес створення і використання Smart-курсу за допомогою безкоштовного сервісу Google Classroom. Використання Smart-курсу, розробленого за допомогою інтерактивних сервісів у поєднанні з традиційною методикою викладання інформаційних технологій, надало змогу перевести спілкування учнів і викладачів на новий рівень – необмежений рамками аудиторії. У Google Classroom викладачі можуть публікувати завдання, розсилати оголошення, починати обговорення, а учні – обмінюватися матеріалами, додавати коментарі в стрічці курсу, спілкуватися електронною поштою. Інформація щодо виконаних робіт постійно оновлюється, що дозволяє викладачам оперативної перевіряти завдання, здійснювати моніторинг знань учнів.

У статті доведено ефективність використання Smart-курсу на основі Google Classroom для формування інформаційних знань, умінь і навичок учнів спеціальності «Оператор з обробки інформації та програмного забезпечення».

Ключові слова: онлайн навчання; Google Classroom; Smart-курс; Smart-технології; Smart-навчання.

GOOGLE CLASSROOM КАК ЭФФЕКТИВНОЕ СРЕДСТВО SMART-ОБУЧЕНИЯ И МОНИТОРИНГА ЗНАНИЙ УЧЕНИКОВ В УЧРЕЖДЕНИЯХ ПРОФЕССИОНАЛЬНО-ТЕХНИЧЕСКОГО ОБРАЗОВАНИЯ

Гуревич Роман Семенович

действительный член (академик) НАПН Украины, профессор, доктор педагогических наук, директор Учебно-научного института педагогики, психологии, подготовки специалистов высшей квалификации Винницкий государственный педагогический университет имени Михаила Коцюбинского, г. Винница, Украина

gurrom@icloud.com

Шахина Ирина Юрьевна

кандидат педагогических наук, доцент кафедры инновационных и информационных технологий в образовании Винницкий государственный педагогический университет имени Михаила Коцюбинского, г. Винница, Украина

rom.shahin@gmail.com

Подзигун Елена Анатольевна

кандидат педагогических наук, доцент кафедры методики обучения иностранных языков Винницкий государственный педагогический университет имени Михаила Коцюбинского, г. Винница, Украина

podzigun77@gmail.com

Аннотация. В статье рассматривается контроль уровня знаний учащихся в организации учебного процесса на основе образовательной технологии. Процедура контроля в процессе обучения выполняет функцию обеспечения качественного уровня знаний учащихся. Установлено, что модернизация контроля образовательного процесса требует современной компьютерной техники и средств коммуникации. Проведение электронного контроля знаний является основой получения объективной независимой оценки уровня учебных достижений (знаний, интеллектуальных умений и практических навыков) учащихся. Отмечено, что компьютерное тестирование относится к адаптивной модели педагогического тестирования, которая опирается на классическую модель с учетом сложности задач. Приведен перечень интернет-сервисов для создания тестов широкого назначения, а именно: Google Forms, LEARNINGAPPS.ORG, PROPROFS, ClassMarker.

На основе анализа форм обучения представлен способ организации обучения учащихся с помощью платформы Google, в частности сервиса Google Classroom (система управления обучением), который необходим для обеспечения онлайн-обучения и эффективного контроля знаний учащихся по предметам по специальности. Констатируется, что Google Classroom как отдельная система управления обучением, в отличие от своих предшественников, позволяет преподавателям использовать интегрированные инструменты пакета Google Apps, например, Google Drive и Gmail. Определены основные возможности использования Google Classroom для организации Smart-обучения и мониторинга знаний учащихся. В статье также предоставлена подробная информация о возможностях отдельных пользователей в Google Classroom (преподавателей, учащихся, кураторов, родителей, администраторов).

Использование Smart-курса, разработанного с помощью интерактивных сервисов в сочетании с традиционной методикой преподавания информационных технологий, дало возможность перевести общение учащихся и преподавателей на новый уровень – неограниченный рамками аудитории. В Google Classroom преподаватели могут публиковать задания, рассылать объявления, начинать обсуждения, а ученики – обмениваться материалами, добавлять комментарии в ленте курса, общаться по электронной почте. Информация о выполненных работах постоянно обновляется, позволяя преподавателям оперативно проверять задания, осуществлять мониторинг знаний учащихся.

В статье доказана эффективность использования Smart-курса на основе Google Classroom для формирования информационных знаний, умений и навыков учащихся специальности «Оператор по обработке информации и программного обеспечения».

Ключевые слова: онлайн обучение; Google Classroom; Smart-курс; Smart-технологии; Smart-обучение.

