CONTEMPORARY TECHNOLOGIES IN THE EDUCATIONAL PROCESS

Edited by Magdalena Wierzbik-Strońska,
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TABLE OF CONTENTS:

PREFACE

Today, society is interested in graduates with advanced cognitive needs, aimed at self-actualization and personal development, who are able to use the knowledge gained, navigate the information space, work and collaborate effectively, assess their skills and achievements appropriately.

Now society has already shifted its priorities; the term information society has appeared. It is interested in its citizens being able to work independently and hard, make decisions, adapt to changing conditions quickly.

All these circumstances require new research in the field of subject teaching methodology, the search for innovative strategies, forms and methods of raising and education connected with the development and implementation of modern educational and information technologies in educational process.

Teachers' competence in the most effective use of information, interactive communication technologies while founding and developing a universal sphere of education is increasing; the formation of a new pedagogical thinking culture is stimulated.

The use of modern pedagogical technologies in the educational process of the higher education institution creates completely new opportunities for the implementation of the didactic principles of individualization and differentiation in teaching, has a positive impact on the development of students' cognitive activity, their creative activity, consciousness, realizes the transition from traditional learning to self-education.

Modern approaches to the development of different educational technologies are researched in the monograph. We consider conditions and factors under which the development and the usage of innovative technologies in education can be analyzed. The concept of system methodology and constructive principles of the technological support of learning activities have been substantiated.

Part 1 of the monograph is dedicated to information technology and innovations in distance learning. Distance learning in modern conditions is considered in this part; online lectures and webinars as a form of training in distance learning, online courses and the use of andragogy principles of learning in the post-covid era. Attention is drawn to new information technologies as a way to intensify students' project work.

Part 2 presents innovations in training specialists in different fields. The authors define the role of heuristic technologies in the formation of students' critical thinking skills, organizational and innovative approaches to the development of labor resources in the service sector in the regional educational services market, the level of motivation formation of future teachers' for a healthy lifestyle and their physical state.

Part 3 includes the researches which are devoted to the use of innovative forms of learning in physical education and sports, at physical education lessons with high school students, the use of adaptive physical education for the children with hearing loss in secondary school.

The monograph is the collective research about the foundation and development of modern technologies in educational process.

Yours sincerely,
Magdalena Wierzbik-Strońska,
Galyna Buchkivska

1.5. METHOD OF APPLICATION OF YOUTUBE IN CONDUCTING INTEGRATED LESSONS OF NATURAL AND MATHEMATICAL CYCLE OF BASIC SECONDARY EDUCATION IN THE NEW UKRAINIAN SCHOOL

Actuality. Informatization, digitalization and globalization as the driving processes of development of modern society are rapidly spreading in the educational space. The popularity of media resources among students and teachers gives us reason to believe that the use of video hosting will become an integral part of the educational process.

The use of the latest technologies in the XXI century is not just a whim, a requirement of the time, one of the key competencies of a modern teacher. The worldview of the modern generation is changing rapidly, students need new forms and methods in learning. In order to meet the needs of the modern student, teachers are increasingly resorting to innovation in the educational process.

In today's world, video is used not only for entertainment, but also for teaching and education. In the last few years, the use of video in lessons, especially integrated ones, has increased significantly due to the increase in educational content on various video hosting services. Integrated lessons of the natural-mathematical cycle with the involvement of video materials have a lot of advantages. This is the gamification of learning, and interactivity, and improving the technological literacy of students, and the implementation of communicative-activity and individual approaches, and, most importantly, a great tool for motivation.

The use of YouTube video hosting requires a special role. Thousands of videos appear on this service every day, giving teachers the opportunity to use them during different stages of the lesson. However, the correct use of video content requires appropriate methodological training, developed a system of tasks and exercises, training of students, without which the usual viewing will not have an educational and cognitive nature.

Ralph Tyler, a major figure in American education in the twentieth century, described subject integration as a "horizontal relationship of curricula," and he considered such connections important for learning. His claims were based on research on eight-year curriculum for students in 30 high schools in the 1930 years. Researchers then found that students studied well in those high schools that filled the curriculum not only with individual subjects, but also with courses on general topics related to disciplines[68].

In the New Ukrainian School during the integration of subjects of the natural-mathematical cycle, the use of video in lessons is not only appropriate, but also obligatory, which helps to increase motivation and interest of students during integrated lessons of the natural-mathematical cycle. Moreover, the Ministry of Education and Science of Ukraine gives teachers complete freedom in choosing educational video content[69;70]. Working with such materials in the classroom diversifies the activities of students in the process of teaching natural sciences and mathematics. Videos make the lesson interesting for all students, increase the level of motivation.

Analysis of recent research and publications. Problems of video application during lessons are covered in researches of domestic scientists O. Barmenkova, D. Buchinska, N. Bychkova, A. Kaptereva, O. Shlikova, Yu. Fedorenko, T. Leontieva, Yu. Verisokina, T. Yakhunova, O. Yuzyk. V.Wember. However, after analyzing the professional literature and Internet sources, we found that the feasibility and effectiveness of the use of video during lessons are mostly studied by scientists from Germany, Great Britain, USA (K. Deschan-Potter, L. Clark, D. Wiedemann, E. Dale, M. Clant, J. Golden, S. C. Diamond, M. Kepser, L. Bents, A. Thompson, E. Ramos, S. Stemplesky, M. Collins, G. Tulodzhetsky, P. Arcario, M. Simons, S. Gillett, R. A. Burke,

[68] Integrated learning as an educational puzzle [Electronic resource]: / Inna Dyomina // Access mode: https://nus.org.ua/view/integrovane-navchannya-yak-osvitnij-pazl. Name from the screen.

[69] New Ukrainian school. Conceptual principles of secondary school reform / Ministry of Education and Science of Ukraine. [Cited 14. 08. 2020.] Available online:: https://www.kmu.gov.ua/storage/app/media/reforms/ukrainska-shkola-compressed.pdf.

[70] Integrated learning as an educational puzzle [Electronic resource]: / Inna Dyomina // Access mode: https://nus.org.ua/view/integrovane-navchannya-yak-osvitnij-pazl. Name from the screen.

K. Goetch, J. Rowenkamp, N. Salegi, I. Tayron, W. Abraham, K. Wegener, S. Gretz, I. Mueller, S. Gillette, M. Simmons, G. Toischer, S. Folk).

Selection of previously unsolved parts of the problem. Despite the large number of scientific papers on this issue, the question of how to use YouTube video hosting in the lessons of the natural sciences and mathematics cycle remains unresolved.

The aim of the article is to characterize the peculiarities of the method of using YouTube video hosting as one of the newest teaching aids in conducting integrated lessons of the natural-mathematical cycle of basic secondary education in the New Ukrainian school.

Tasks:

- to determine the features of conducting integrated lessons of the natural-mathematical cycle in the basic secondary school in accordance with the concept of the New Ukrainian school;
- to determine the method of using YouTube video hosting in conducting integrated lessons of the natural-mathematical cycle in the basic secondary school in accordance with the concept of the New Ukrainian School;
- describe the feasibility of using video during integrated lessons of the natural-mathematical cycle;
- identify the types of video content that can be used during the integrated lessons of the natural-mathematical cycle in the basic secondary school in accordance with the concept of the New Ukrainian School.

Presenting main material. Everyone's activities are associated with a large number of psychological factors. Psychologists claim that the use of video materials in the educational process significantly improves the final results and much more motivates students to learn. Taking into account the interest of students in social networks (Instagram, Facebook, TikTok), which are for them the most spectacular and able to arouse interest and maintain attention for a long time, psychologically justify the use of video in integrated lessons of natural sciences in the New Ukrainian School.

Using video clips, we encourage human visual and auditory centers to influence the process of learning and memorizing material. The use of videos is also used as a means of harmonizing the relationships, goals, intentions, ideas, opinions of all participants in the educational process. Such harmonization ensures the preservation of their emotional perception of educational reality and response to this reality, which ensures the creation of an optimal psychological climate for learning and achieving the best results. This process is called neurolinguistic programming in psychology and was first developed in the 70s of the twentieth century by American researchers R. Bandler and J. Grindler. These psychoanalysts have concluded that the basis of any learning process should be an emotional factor that either encourages students to acquire knowledge, or produces in them a strong motive for confrontation[71].

During the research of O. Yu. Koval and K. V. Melnyk, students were interviewed about which video on YouTube they like to watch during the integrated lessons of the natural-mathematical cycle[72]. The results are shown in the diagram.

As can be seen from the chart, the vast majority of respondents prefer to watch video clips, animated videos, popular science films, which indicates the great popularity of YouTube video hosting among elementary school students. YouTube is a powerful tool for preparing videos for science and math lessons, as well as an indispensable means of motivation.

The effectiveness of activities in the classroom with the use of innovative technologies depends primarily on well-being in the socio-psychological aspect. The student will be interested if he is not afraid of the atmosphere of the lesson, which consists of various aspects of his own

[71] Wember V., Buchynska D. Modern types of educational video and features of their use in the educational process / Educational Discourse, 2016, № 1 (13). p. 19-20.

[72] Koval O. Yu., Melnik K. V. The use of video materials as a means of forming foreign language competence in students / Innovative scientific research in the field of pedagogical and psychological sciences: materials of the international scientific-practical conference, Kyiv, May 4-5, 2018, Kyiv: Tavriya National University named after V. I. Vernadsky, 2018. p. 36-38.

activities and activities of the teacher, if the lesson does not criticize his personality by the teacher or classmates, and comments are constructive and relate primarily to the results of his activities. He feels safe if any of his contributions to the learning process are valued. Only in the absence of fear of the new that the teacher offers, the student will allow himself to experiment with patterns of behaviour, finding the optimal result of their behaviour, determining their role in working together, choosing and forming their position, their point of view, constructing their knowledge. As in other spheres of social life, in the education system, innovation processes are not just the introduction of something new. They are implemented as purposeful changes in goals, conditions, content, means, methods, forms of activity, which are characterized by novelty, high potential for efficiency in general or in certain areas, the ability to provide long-term benefits, consistency with other innovations.

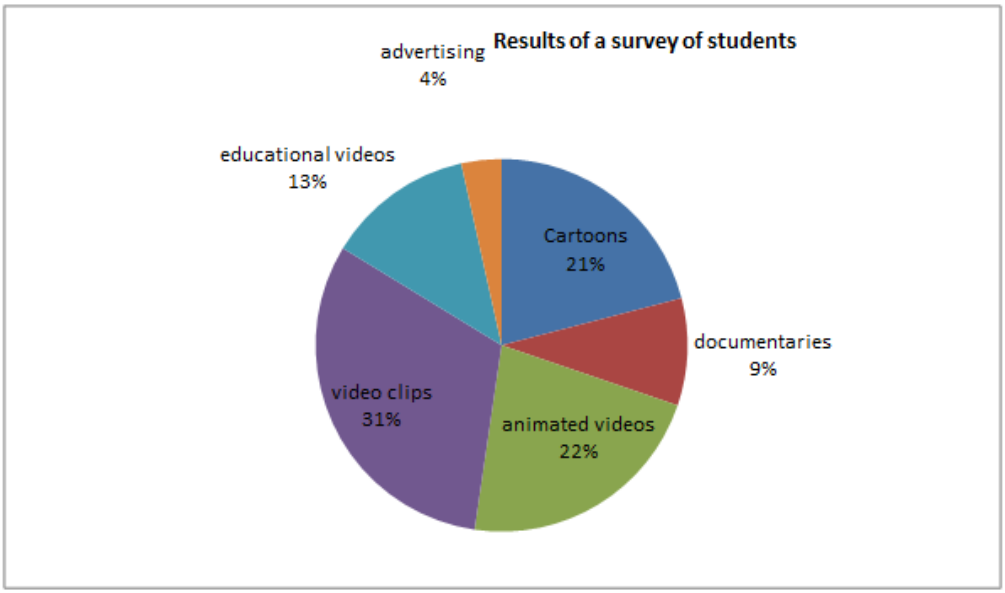

Fig. 1. Results of a survey of students

The modern system of education is aimed at forming a highly educated, intellectually developed personality with a holistic view of the world, with an understanding of the depth of connections, phenomena and processes in the surrounding reality. Subjective disunity is one of the reasons for the fragmentation of the worldview of a school graduate, while in the modern world the tendencies to economic, political, cultural, information integration prevail.

Our time is characterized by the integration of sciences, the desire to get as accurate an idea of the general picture of the world. These ideas are reflected in the concept of the New Ukrainian School. But it is impossible to solve such a problem within one subject. Therefore, in the theory and practice of teaching there is a tendency to integrate academic disciplines, which allows students to achieve interdisciplinary generalizations and better mastering of educational material[73].

Mastering the technique of transferring knowledge about one subject while mastering another makes the analytical and synthetic activities of students purposeful, increases the effectiveness of independent methods of work, provides a remarkable organization of mental activity and, finally, produces a logical sequence in performing both general and specific tasks. Integrated lessons pursue the goal of developing figurative thinking of the student. The integrated lesson combines blocks of knowledge from different subjects, topics around one problem in order to informationally and emotionally enrich the perception, thinking, feelings of the student, which allows to learn a phenomenon in many ways, to achieve the integrity of knowledge. It is aimed at revealing the

[73] Kozlovska I. M. Integration and continuity in the development of educational knowledge: methodological aspect / I. M Kozlovska, A. V Lytvyn // Continuous professional education: theory and practice: collection. Science.works: in two parts / ed. I. F. Zyazyun, N. G. Nichkalo. K., 2001. p. 177-178.

general laws, ideas, theories reflected in various sciences and their corresponding subjects. This lesson provides students with a holistic system of ideas about the dialectical-materialist laws of knowledge of the world around them in their relationship and interdependence, and contributes to the deepening and expansion of students' knowledge, the range of their practical application. Such lessons develop analytical abilities and ingenuity, have great educational potential and lead to the disclosure of creative potential in students[74].

Integration is focused on preparing the student for life in modern society, for a decent choice of their own life and professional position; promotes the development of creativity, communication skills. It promotes the development of a scientific style of thinking, allows students to widely use the scientific method of cognition. This forms a comprehensive approach to the subject, the only point of view from the point of view of the natural sciences on a problem that will reflect the objective connections in the world around.

The scientific foundations of this pedagogical technology are laid in the works of I. P. Pavlov and I. M. Sechenov. Later, psychologists, after analyzing the features of thinking and memory, concluded that the learning process should be designed to form in students the ability to reproduce previously acquired knowledge for strong memorization of new material. Objects and phenomena are interconnected both in nature and in human memory. Interdisciplinary connections make it possible to consider an object or phenomenon from different angles and on the basis of intersystem associations to remember them well [75].

The most important characteristics of memorization are the methods of semantic grouping of educational material, the separation of semantic reference points and the semantic relationship of new material with the already known. Thus, mastering the technique of transferring knowledge about one subject while mastering another makes students' analytical and synthetic activities purposeful, increases the efficiency of independent methods of work, provides excellent organization of mental activity and, finally, produces a logical sequence in performing both general and specific tasks.

Thus, the integration between subjects does not negate the subject system. It is a possible way to improve it, overcome shortcomings and aims to deepen the relationships and interdependencies between subjects. Integration is an extremely attractive form of lesson for a child. Children are more prone to fatigue, which is caused by monotony. Another, unusual course of the lesson, arouses his interest and stimulates activity.

The integration of subjects in the New Ukrainian School is one of the areas of active search for the latest pedagogical solutions that contribute to the improvement of affairs in it, the development of creative potential of teaching staff and individual teachers in order to positively influence students. This is not only a new stage in the professional activity of a teacher, but also a great opportunity for him to reach a new level of relations with the class. This is another way to bring students to understand the integrity of the world, its beauty and harmony, as well as to help determine each student's purpose in society[76].

One of the factors that optimizes learning, which causes the greatest difficulties for teachers, is the organization of educational activities using interdisciplinary links. The reasons for the difficulties in the practical implementation of interdisciplinary links are both objective and subjective. The objective reason is the lack of methodological recommendations in this area, coordination of the activities of subject teachers. Subjective reasons are ignorance in the content of programs in related subjects, lack of knowledge and skills, lack of experience in the implementation of links between subjects, the implementation of interdisciplinary links in school practice is not complete.

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[74] Ibid, p. 180-181.

[75] Ozarchuk A. V. The use of YouTube video hosting in conducting integrated lessons of the natural-mathematical cycle. Mashcha, 2018. – P. 8-10.

[76] New Ukrainian school. Conceptual principles of secondary school reform / Ministry of Education and Science of Ukraine. [Cited 14. 08. 2020.] Available online: https://www.kmu.gov.ua/storage/app/media/reforms/ukrainska-shkola-compressed.pdf.

Analysis of pedagogical research suggests that integrated learning gives the freedom to choose the topic, content, tools used in the organization of education in accordance with the concept of the New Ukrainian School. This choice is due to the long-term and current didactic, educational and developmental tasks of the educational process of basic secondary school.

The technology of conducting an integrated lesson can be different. It depends on the goals, objectives, content of the lesson, methods of activity, situations that arise in the process. Traditionally, it is as follows: the message of the topic, acquainting students with the goals and objectives of the lesson, introductory speech of the teacher (student), communication teachers and students, comments, additions, mastering, reviewing, summarizing the lesson[77]. Not only subject teachers prepare for the lesson, but also students who write essays, select material for individual reports, messages, illustrations, presentations, videos, etc.

An important role in improving the efficiency of the integrated lesson is played by its educational and technical equipment (demonstration materials and devices, materials for experiments, observations, audiovisual aids, tables, graphs, diagrams, algorithms, instructions, simulators, multimedia equipment, etc.). Therefore, such lessons are held with special impact in the classrooms, where the maximum conditions for the perception and assimilation of new material are created. These are classrooms of computer science, geography, biology, physics, mathematics, chemistry.

To date, there are many services with video content for the preparation of integrated lessons of natural sciences and mathematics. However, there are certain selection criteria:

- the interest of the audience;
- relevance of the content;
- video duration;
- presence or absence of accompanying supports.

When selecting a video for an integrated lesson, keep in mind that the content of the content corresponds to the topic of the disciplines in which the lesson is conducted.

As an example, we can cite a fragment of an integrated lesson of geography and computer science in 7th grade with the topics "General characteristics of the climate of Eurasia" and "Creating diagrams. Analysis of the data presented in the diagram. At the stage of motivation of educational and cognitive activities, students are invited to watch videos from YouTube "Interesting facts about the climate"(accessmode:https://www.youtube.com/watch?v=BV90I9Uhe2s&t=168s), as well as "Global Climate Change" (access mode:
https://www.youtube.com/watch?v=TSiDG70Wsn4).

At the stage of learning new material, students are shown the video "Climate-forming factors" (access mode:https://www.youtube.com/watch?v=bZwq_1FptlM). At the stage of practical application of the acquired knowledge, students create diagrams of different types based on video data. Also at the stage of reflection, it is advisable to demonstrate to students the video "Global Climate Change and its Consequences for Ukraine". Access mode:
https://www.youtube.com/watch?v=DJQzekr_0pc [78].

Another example of the use of YouTube video hosting is a fragment of an integrated lesson in chemistry, ecology and geography on the topic of "Water". At the stage of goal setting and motivation, you can demonstrate a fragment of the video "Secrets of water. The world you live in ”(access mode: https://www.youtube.com/watch?v=0bXyZDj3gbc)”. During the study phase of the new material it is worth showing the video "Aggregate states of water" (access mode: https://www.youtube.com/watch?v=URiFeNBaPKU), "Water properties" (access mode: https://www.youtube .com / watch? v = 4zaHedPdLFI). At the stage of consolidation, it is advisable to demonstrate the impact of water on the environment; The best video is "Power of Water" (access mode: https://www.youtube.com/watch?v=FABxRzeZiZY&t=16s). At the stage of reflection,

[77] Padun N. O. Features of forms of integrated learning in modern school / N. O. Padun, N. Y. Andriyiv // Scientific notes of Nizhyn State University named after M. Gogol. Psychological and pedagogical sciences. 2011. № 1. – S. 82.
[78] Ozarchuk A. V. The use of YouTube video hosting in conducting integrated lessons of the natural-mathematical cycle. Mashcha, 2018. P. 38-40.

students will be interested to demonstrate experiments with water (access mode: https://www.youtube.com/watch?v=FABxRzeZiZY&t=16s).

It should be noted that in the institutes of postgraduate pedagogical education, teachers recommend students to implement elements of ICT in their lessons. They not only recommend, but also work out the method of using the YouTube video host [79].

Conclusions. In the course of the research, we found that the number of videos on YouTube is sufficient for use in integrated lessons of the natural sciences and mathematics cycle. However, when preparing for these types of lessons, teachers should carefully consider the algorithm for using video hosting at different stages of the lesson. Also, do not forget about the oversaturation of the integrated lesson with video materials, as too many of them can distract students from the main topic.

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