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IMPLEMENTING THE THEORY OF MULTIPLE INTELLIGENCES INTO PROJECT-BASED MULTIMEDIA LEARNING AT PRIMARY SCHOOL

Abstract. The article substantiates the relevance of the use of project-based multimedia learning at primary school. Feasibility of implementing H. Gardner's theory of multiple intelligences for optimization and increase of efficiency of such work is presented. According to this theory, each person possesses a certain number of relatively autonomous intelligences: verbal-linguistic, logical-mathematical, visual-spatial, kinaesthetic, musical, interpersonal, intrapersonal, naturalistic. Each person has his or her own intellectual profile which is determined by heredity and life experience. The essential characteristics of project-based multimedia learning are determined, in particular, the importance of a teacher's role during the organization of project-based multimedia learning at primary school is emphasized. Critical analysis of theoretical and practical research has proven the need to study the influence of the information and communication technologies on primary school children with different types of intelligence. The empirical study has identified the correlation between types of intelligence and ICT tools for teaching young students. The authors of the study conclude that the use of multimedia educational projects increases interest and motivates students to engage in learning activities taking into account their psychological features, helps participants in the educational process to rationally plan their activities and better perceive and remember information. The article substantiates the technology of project-based multimedia learning of primary school children in accordance with the theory of multiple intelligences, which determines the sequence of a teacher's steps for effective organization of project-based multimedia learning based on H. Gardner's theory of multiple intelligences. The steps or stages of the proposed technology include determining the dominant types of intelligences of each student in the class; organizing students into homogeneous or heterogeneous groups according to their types of intelligences, taking into consideration the goals and objectives of the multimedia project; dividing responsibilities in the group and supporting each student's work with the appropriate software or Internet resource; conducting general control over the work of the project groups and assisting in the presentation of the multimedia project results.

Keywords: primary school; project-based learning; theory of multiple intelligences; software; multimedia educational project.

1. INTRODUCTION

The problem statement. The relevance of the research topic is conditioned by the transition of education to a child-centred, competence- and activity-based approach, as stated in the "New Ukrainian School" Conceptual foundations for reforming secondary education. Modern requirements of society for the educational process demand its practical orientation, in particular on the basis of the latest technologies, and creating conditions for students' self-development and self-expression, taking into account their individual characteristics. The legal basis for the introduction of the latest technologies in the educational process of general secondary education institutions in Ukraine is the decrees of the Cabinet of Ministers "On Approval of the State Policy Implementation Concept in the Field of Reforming the General Secondary Education "New Ukrainian School" for the Period up to 2029", "On Approval of the Action Plan for 2017-2029 on Implementation of the State Policy Concept in the Field of Reforming the General Secondary Education "New Ukrainian School", and the orders of the Ministry of Education, Youth and Sports of Ukraine "On Measures for Implementation of E-learning Content", "On Approval of the Regulation on the Electronic Textbook".

Implementation of the requirements of these regulations involves updating both the content and methodological components of the educational process. And if changes in educational content are mainly regulated by the State Standard of Primary Education, the modern Ukrainian school is not completely ready for methodological changes yet. The reasons are the insufficient development of the theoretical foundations for the use of ICT and multimedia technologies at primary school and the limited experience of their use. The same applies to the implementation in the educational process of one of the effective varieties of ICT and multimedia technologies – project-based learning. At the same time, international science and practice offer sufficient experience for the implementation of project-based learning in the Ukrainian context, which will help accelerate the process of integration of Ukrainian education into the European and global educational space.

Analysis of recent studies and publications. The psychological and pedagogical science has accumulated a considerable theoretical potential and practical experience of using information technologies in the educational process (V. Andrushchenko, G. Ball, N. Balyk, V. Bykov, I. Bulakh, Y. Valkman, R. Gurevych, A. Gurzhiy, A. Yershov, M. Zhaldak, Y. Zhuk, Y. Mashbyts, V. Monakhov, Y. Ramskyi, M. Smulson, O. Spivakovskyi, M. Uhrynovych, etc.). The specificity of using information and communication technologies in learning and communication in the "teacher – student" system is revealed in works by A. Brushlynskyi, T. Habay, O. Matyushkin. The specificity of secondary and higher education informatization is determined by V. Bykov, B. Gershunskyi, S Honcharenko, R. Hurevych, M. Zhaldak, Y. Zhuk, V. Mykhalevych, N. Morze, Y. Ryvkind, P. Stefanenko, O. Spivakovskyi and others. These researchers shed light on the problems of informatization methodology. The research by N. Talyzina, Y. Mashbyts, V. Rubtsov is devoted to the psychology of computer learning.

General methodological issues of using computers in the educational process for the purpose of its intensification are reflected in the works by S. Arkhangelskyi, V. Bondarenko, V. Bespalko, B. Hershunskyi, T. Habay, V. Zhytomyrskyi, G. Ivshyna, G. Kyrylova, Y. Mashbyts, L. Pressman, I. Romanov, V. Monakhov, Ye. Polat, I. Robert. Systematic approaches to solving the problems of computer learning didactics are presented in the works by O. Okolelov, A. Solovyov, A. Zolotaryov. The aspects of primary school teachers' ICT-competence formation are covered in the works by I. Belavina, O. Bovt, O. Doronina, D. Zaretskyi, R. Motsyk, O. Nikulochkina, L. Petukhova, O. Shyman, O. Sukhovirskyi and others.

Reasons for hindering the widespread adoption of ICT in the educational process have been identified: lack of courses for developing teachers' information and communication competence, lack of understanding the methodological aspects that enable teachers to competently develop younger students' skills and habits of using ICT tools in numerical, graphic and audio processing, as well as while working with electronic educational resources [1]. At the same time, many experts and practical teachers point out that current digital educational and methodological tools, including a large number of electronic educational resources, despite their high educational potential are rarely, haphazardly used, mainly to control knowledge and form reproductive skills [2]. Therefore, there is a need to justify different possibilities of using ICT at primary school, based on the achievements of modern psychological and pedagogical research.

The article's goal is to justify the author's technology of project-based multimedia learning at primary school, developed on the basis of H. Gardner's theory of multiple intelligences, which allow creating optimal conditions for primary school pupils with different types of intelligences in order to maximize their involvement and development of their skills, as the project work simplifies and individualizes the task of finding information, increases interest and motivates students to engage in learning activities in view of their psychological features, helps participants in the educational process to rationally plan their activities and better perceive and remember information.

2. THE THEORETICAL BACKGROUNDS

The theoretical basis of our study is H. Gardner's theory that each personality has many types of intelligence [3]. Each of these types presents specific ways of processing and interpreting information, thus informing how each person knows the world. The author of this theory states that intelligence is dynamic and multidimensional, going beyond the capabilities of linguistic and logical abilities that have traditionally been diagnosed in the learning process. According to H. Gardner, each person has different types of intelligence reflecting different ways of cognitive interaction with the world. Initially, the scientist distinguished seven intelligences – verbal-linguistic, logical-mathematical, intrapersonal, spatial-visual, musical, bodily-kinaesthetic, interpersonal, and later added the naturalistic one. These kinds of intelligence are used differently by each individual, but one or more of them can dominate [3] – [5].

The introduction of multiple intelligence theory into the pedagogical practice changed teachers' perceptions of the essence of teaching and learning processes in such a way that they began to take into account students' individual differences in their ways of perceiving educational material, to provide a wide range of different types of activities which enriched personal experience, accelerated and facilitated the process of learning, helped improve student achievement [6].

According to K. Greenberg, R. Z. Zheng, & I. Maloy [6], E. Hunt [7], and R. F. Islam [8], today most educators believe that the theory of multiple intelligence is an axiom that must be taken into account, first of all, when designing and conducting various classes. A number of Ukrainian scientists (M. Leshchenko, L. Baysar, M. Husak, N. Lavrychenko, L. Tymchuk, N. Antonenko, V. Petrakovych, I. Yanenko, etc.) have researched the nature of H. Gardner's theory and application of multiple intelligence theory at English classes. Since the practical use of H. Gardner's theory has led to revolutionary changes in contemporary foreign didactics, there is an urgent need to research the essence of this theory and possible ways of its application in educational practices in Ukraine.

In his theory H. Gardner suggested that it is expedient to use the category of multiple intelligence to characterize a person's mental abilities, that is, each person possesses a certain

number of relatively autonomous intelligences: linguistic, logical, spatial, body-kinaesthetic, musical, interpersonal. These kinds of intelligence can be possessed by everyone and their existence, from a cognitive point of view, makes us human. Each person has their own intellectual profile, which is determined by heredity and life experience [3] – [5].

H. Gardner defined the concept of "intelligence" as the defining characteristic of all people (each of us possesses all kinds of intelligence); the quality that distinguishes people from each other (no two people have exactly the same intellectual profiles); a way of performing a cognitive task by a person taking into account their own interests [4].

Each type of intelligence has its own characteristics, which are manifested in childhood. Everyone is unique and can develop not only pronounced types of intelligence, but also less developed types at the expense of more advanced ones. Types of intelligence are probably of neuro-psychic nature and can be activated depending on the values that dominate the culture, as well as through personal decisions made by the individual, his or her family and environment.

The description of the human capabilities depending on the type of intelligence involved is presented below.

The verbal-linguistic intelligence is characterized by an interest in linguistic constructions, the world of language (word), oral and written speech, ability to speak, logical construction and description of events; ability to rhyme, sensitivity to the meaning of words and sounds. Knowledge and understanding of the world come through the word.

The logical-mathematical kind of intelligence is characterized by an interest in the world of objects, numerical symbols and mathematical operations. Knowledge and understanding of the world come through quantitative account and sequence of events.

The kinaesthetic (motional) intelligence is characterized by the ability to operate one's own body, to use controlled movements, to use and manipulate various objects skilfully. Knowledge and understanding of the world come through movement and physical contact.

The visual-spatial intelligence is characterized by the ability to create imagery, spatial imagination and visualization. Knowledge and understanding of the world come through images and forms, spatial imagination.

The musical kind of intelligence is characterized by the presence of subtle sensory perception and easy creation of music, perception and understanding of the structure of musical works, high musicality. Knowledge and understanding of the world come through sounds, rhythm, melody, composition.

The intrapersonal intelligence is characterized by high self-awareness, ability to reflect, considerations of one's own behaviour, motivation, emotions, ability to provide adequate self-esteem, to find answers to difficult questions. Knowledge and understanding of the world come through our own experience, self-knowledge (through our own prism).

The interpersonal intelligence is characterized by the ability to interact with others, to understand others, to empathize and to communicate, to negotiate and to find compromises. Knowledge and understanding of the world come through the understanding of others (the prism of another person).

The naturalistic intelligence was proposed by H. Gardner in 1995. This kind of intelligence is about finding and transmitting information through the natural environment. The naturalistic intelligence is characterized by environmental susceptibility rooted deeply in sensitive, ethical and holistic understanding of the world, including the role of humanity within the larger ecosphere [5].

It should be noted that the theory of multiple intelligence is in a dynamic development, as evidenced by the researchers' study of other intelligence types.

Teachers often do not understand the difference between the concepts of intelligence and ability. A scientist uses the concept of intelligence to define the vast possibilities for

processing certain types of information in various ways. The linguistic intelligence is related to the language – both the language that can be heard and the language that can be read; the spatial one is related to the ability of locating objects in a space that may be small (chessboard or sculpture) or a much larger one, the realm of sailors or architects. Each of these intelligences implies many skills. There is no tension between the categories "intelligence" and "ability". This is a question of quantitative nature: many skills can determine intelligence [7].

3. THE RESULTS AND DISCUSSION

3.1. Characteristics of intelligence types by activity types

A student who has a developed linguistic type of intelligence manifests the following characteristics: he/she likes to speak, tell and listen to stories, uses a rich vocabulary, clearly expresses and writes down his/her thoughts, can create interesting and original stories. They easily learn foreign languages, are sensitive to rhythms, sounds, possess good hearing memory, willingly and frequently ask questions. They have a good memory for names, remember difficult words easily, start reading at an early age and enjoy reading. The activities that stimulate the development of the linguistic intelligence are the following: guessing puzzles, word games, reading fairy tales, asking questions, singing, reciting, conversations with a student, telling stories, ending up of the started fairy tales or stories, making up stories, narratives, expressing thoughts on a given topic.

A student who has a developed logical and mathematical kind of intelligence reveals the following features: he/she thinks logically, loves to count, set things in order, expects accurate, specific instructions. Such a student likes to research, collect information, he/she likes logic games, puzzles, math problems and brain teasers. They know how to rank, classify, research, transform things and they draw conclusions from it, easily find the cause, understand the importance of symbols, love precision. The development of the logic and mathematical intelligence is stimulated by the following activities: puzzles, math games, self-solving, counting, puzzle-making, making up stories with defined conditions, cooking according to a recipe, DIY, reflection on watching TV programs and formulating generalizations and conclusions when reading fairy tales.

A student who has a developed kinaesthetic kind of intelligence possesses the following traits: he/she loves physical exercise, motion games, is able to convey emotions with it, is a leader among peers in sports, easily acquires motor skills, has a good sense of distance and space, consciously and purposefully uses movements, manipulates objects, happily performs the tasks requiring manual work, uses "body language" during conversation, makes gestures. The development of kinaesthetic intelligence is carried out by the following activities: sports, participation in dramatic and artistic classes, interpretation of educational material through movement, motion puzzles (puns), expression of emotions through movement, motor games with sports equipment, participation in dramatization, dancing.

A student with advanced visual-spatial intelligence has the following abilities: he/she can observe the environment in detail, is good at working with shapes, lines, space, colour, has creative thinking, figurative memory, developed imagination, likes to play with puzzles, mazes and maps, likes to draw, cut, sculpt, model, create spatial shapes, has a well-developed tactile feel (touch), understands charts, drawings, quickly learns to use maps, charts, tables, figures, likes to disassemble an object into pieces and then put them together trying to figure out how it works, likes reading texts with good illustrations. The development of visual-spatial intelligence is accomplished through the following activities: performing tasks using fine arts as well as various artistic techniques (drawing, sculpting, carving), modelling

(assembly of various models), assembling puzzles, constructor parts, sculpting with plasticine, compiling stories about excursions, travels, expeditions.

Students with advanced musical intelligence have the following abilities: they combine music with emotions, their own mood, have a good musical hearing, a feeling of rhythm, they easily remember a rhythm, love to sing, learn along with some music, listen to music, have their favourite songs, melodies, willingly learn to play musical instruments, sing (croon) during solo games, sing for their own pleasure, make tunes, try to play musical instruments, make sounds from "non-musical" objects. The development of musical intelligence involves performing the following tasks: combining music with all possible kinds of activities, isolating and naming sounds from the environment (during a walk), musical activity in front of the public, replacing words in famous songs (singing in students' own manner, their own version of a song with a famous melody), making up songs, rhyming, listening to music of different genres.

A student with advanced naturalistic (natural) intelligence is characterized by the following features: he/she is interested in the world of plants and animals, problems of ecology, likes being outdoors, self-experimenting, classifies objects, observes, sees relationships in nature, establishes regularities and classifies the world of plants and animals. Such students are fascinated by nature, collect natural specimens, photographs, leaflets, drawings or books about nature, are interested in natural phenomena (physical, chemical), love to care for animals, grow plants or care for them (have a "garden in a pot"). The development of naturalistic (natural) intelligence is carried out during the following activities: monitoring the development of plants, caring for them, walks and field trips, watching television programs about nature, caring for pets, visiting botanical gardens, zoos, exhibitions, etc.

A student with advanced intra-personal intelligence is distinguished by the following features: he/she likes to work independently, knows how to use his/her strengths and is able to do it, builds internal motivation, finds answers to difficult questions, independently defines and clearly delineates his/her own goals, knows how to express his/her feelings, likes to make independent decisions. The development of intra-personal intelligence is stimulated by the following activities: independent choice of new tasks, independent work planning, individual selection of games and fun, choice of the place of work, expression of the student's own position, development of sensitivity to the needs of other people through the selection of literary texts.

A student with developed interpersonal intelligence has the following abilities: he/she loves and knows how to work in a group, easily establishes social contacts, has leadership skills, developed communication skills, listens to the opinions of others, takes care of people, cares for kindness in people's relationships, is able to see the world "through the eyes of another person" and help others in solving their problems, knows how to sympathize, is loved in the team. The development of interpersonal intelligence is carried out through the following activities: conducting games and entertaining in a large group, interpersonal interaction in studies, reviewing illustrations of books in combination with conversations about the feelings and thoughts of the characters.

Competent educators know from their own experience that each student has his or her own peculiarities of perception and assimilation of educational information and this necessitates the need to provide educational material in various ways. H. Gardner's theory of multiple intelligence validates this empirical experience and provides educators with recommendations, tools, and means that allow them to better meet the learning needs of students with different types of cognitive abilities while conducting classes in a variety of disciplines.

In the context of the New Ukrainian School, the foreign experience of introducing the theory of multiple intelligences into educational practices acquires special urgency for the pedagogical community.

3.2. Intelligence types and multimedia technologies

We have analysed the expediency of applying the theory of multiple intelligences as a basis for the ICT choice (Fig. 1).

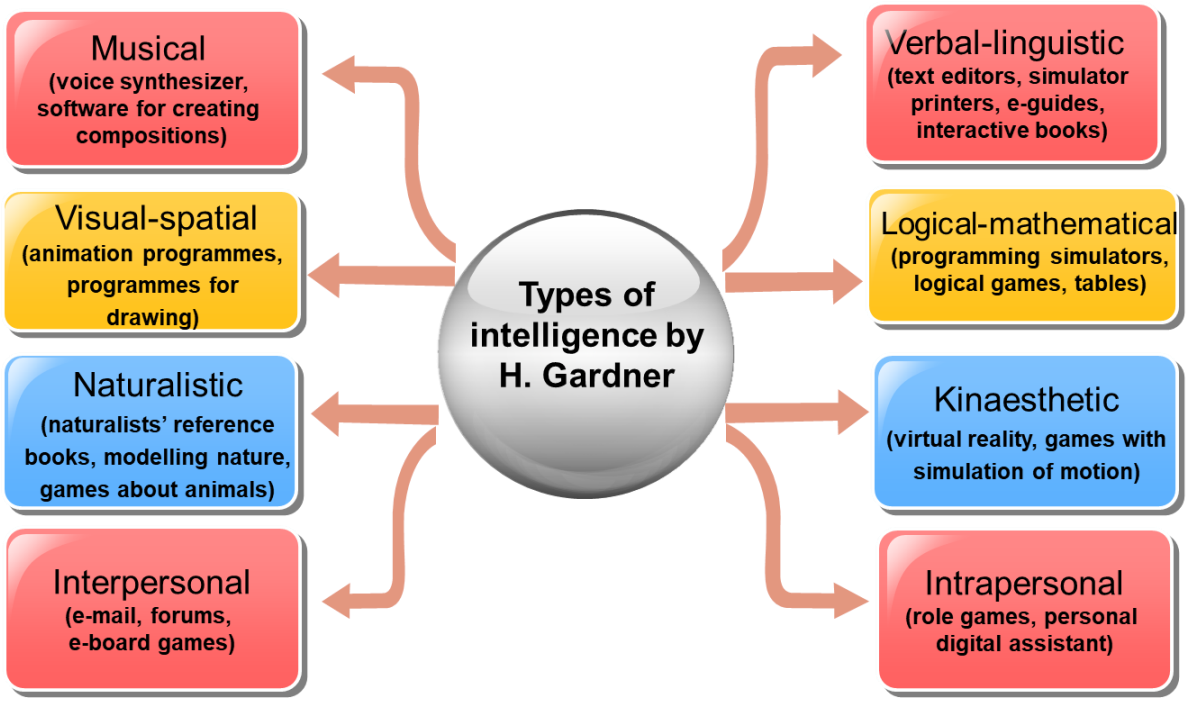

Fig. 1. The correlation between types of intelligence and ICT means for project-based multimedia learning

The analysis of the software that activates different types of intelligence is presented below. The software and Web 2.0 technologies which activate verbal-linguistic intelligence include: word processing programs; simulators for printing; desktop publishing programs; electronic guides; interactive books; word games; foreign language training and translation software; web site creation software; blog development; dictation software.

The software that activates logic and mathematical intelligence combines: manuals on mathematical skills; computer programming simulators; logic games; scientific programs; critical thinking programs; database management; financial management software; scientific directories; tables.

The following software tools help to activate spatial intelligence: animation programs; drawing programs; electronic chess games; space games for solving problems; electronic puzzle sets; art clip-programs; geometry programs; geographical programs; home and landscape design software; maps and atlases; computer software for design; video editing software.

The involvement of bodily kinaesthetic intelligence is affected by: training kits that interact with computers; motion simulation games; virtual reality software; digital tools, reference books on anatomy and human health; physical and athletic training software.

Musical intelligence is activated through the use of the following software: coaches in music literature; voice synthesizer; composition software; tone recognition and tune memory amplifier; instruction manual software for musical instruments; music notation programs.

The software that activates interpersonal intelligence includes: e-mail software; online forums; simulation games; genealogy programs; electronic board games.

Intrapersonal intelligence is stimulated by the following means: personal choice software; career counselling software; self-understanding software; role-playing software; personal digital assistant software; any independence software program.

Naturalistic intelligence is supported through the use of the following software: naturalist reference books; nature modelling programs; software for games about animals; environmental programs; gardening programs.

The use of the Internet provides opportunities for the research and expansion of all types of students' multiple intelligence. One can find web pages relating to each type of intelligence, including mathematical and scientific sites (logical and mathematical intelligence), music download sites (musical intelligence) or image uploads (spatial intelligence), sites on which some content of a naturalistic character is presented (naturalistic intelligence), sites that provide chat rooms and other opportunities for interaction (interpersonal intelligence), and sites that offer opportunities for self-development (intra-personal intelligence).

3.3. Technology of project-based multimedia learning of primary school children according to the theory of multiple intelligences

C. Seabra and A. M. Almeida identify multimedia projects as a unique type of designing innovative products, "with a distinctive set of team members, knowledge and methods" [9, p. 816]. According to K. Vlasenko, O. Kondratyeva, I. Khyzhniak, O. Chumak, & S. Volkov [10], this type of projects contributes to learning in many ways: as an aid to structuring and organising the educational content, as a tool for developing students' presentation skills, and as a motivator for students to actively participate in educational process.

Ya. Yanenko defines the features that are specific to the multimedia creative project:

– at the planning stage, in addition to the choice of the topic and analysis of the target audience of the project, there is a choice of multimedia technologies and tools, communication channels, etc.;

– in class, there is a presentation of the components of the project, which allows the students to receive comments from the teacher on the structure of the project and make the necessary corrections;

– the teacher should develop and present recommendations on the procedure of defense of the creative project (number of slides, recommended structure of the presentation, rules of oral presentations, etc.) [11, p. 179].

Sharing this point of view, we consider that one of the features of multimedia projects at primary school is the important role of a teacher. The teacher becomes a skillful organizer of systematic independent research activities of primary schoolchildren in order to help them acquire knowledge, skills, and abilities. It is advisable to involve parents in the project-based multimedia learning of primary schoolchildren if the implementation of the project includes classroom and extracurricular activities. Helping with advice, information, demonstrating parents' interest are important factors in maintaining motivation and ensuring the independence of primary schoolchildren in the implementation of multimedia project activities.

We agree with W. Penuel, B. Means, and M. Simkins, who consider that multimedia projects "must be extended in time, be included in the core curriculum, involve extensive

student decision making, require small-group collaboration, have a clear real-world connection, and include methods for assessment during the project" [12, p. 37].

Taking into account all the theoretical backgrounds mentioned above, we have developed a technology of project-based multimedia learning at primary school in accordance with the theory of multiple intelligences. The sequence of a teacher's steps in implementing project-based multimedia learning is presented below:

1. Identify the preferred type of intelligence of each young student in the classroom.

The most effective use of technologies to activate multiple intelligence occurs in the implementation of multimedia educational projects. Using multimedia software, we can develop a project that activates different types of intelligence, combining text (linguistic), illustrations (spatial), sound files (music and linguistic), video (body-kinaesthetic and naturalistic intelligence). There are many ways to determine which type of intelligence is best developed in your students: observation, testing, questionnaires, etc. We consider the method for diagnosing types of intelligence proposed by Yu. Bihych [13] to be the most appropriate for use in primary school. It is a questionnaire which consists of 10 blocks with 8 statements in each. A respondent is asked to choose one statement in each block which suits him or her best. Here is an example of the statements from the questionnaire:

1. Arranging things matters to me.
2. I remember words better when I rhyme them.
3. Riddles, puzzles that require logical solutions and reasoning are very interesting.
4. I like TV and radio talk shows.
5. Self-expression through dancing is beautiful.
6. Solving crosswords and puzzles is an interesting activity.
7. Independent work can be more productive than group work.
8. Graphs, diagrams, tables help me organize information.

2. Form the groups (homogeneous and heterogeneous) for the project implementation depending on its purpose and objectives [12, p. 16].

We believe that in the project-based teaching primary school teachers mainly deal with heterogeneous groups, which include children with different types of intelligence, as project activities usually require the comprehensive work with different types of information. In this case, there may be a division of responsibilities within each group with the maximum benefit from each participant. In addition, children who can express themselves in the best way are highly motivated, they increase their desire to learn, gain more self-confidence, etc.

Homogeneous groups should be created if the project aims to process homogeneous information, for instance, musical, literary, natural projects. It is better if such projects are implemented simultaneously by children set in different groups by the type of intelligence.

3. Provide each group with the specific instructions on the purpose, objectives, content, and scope of work. The teacher should divide the responsibilities within the group according to the type of intelligence of each participant and the groups of computer software and Internet resources that correspond to each of the types. The correlation between the groups of computer software and Internet resources and the types of intelligence of primary schoolchildren is shown in Table 1.

Table 1

The correlation between intelligence types of primary school children and computer software or Internet resources

№	Type of intelligence	Computer software / Internet resources
1	Verbal-linguistic	MS Word OpenOffice LibreOffice

		Google Docs Google Translator Blogs
2	Logical-mathematical	MS Excel MS Access OpenOffice LibreOffice Google Tables
3	Musical	You Tube SoundCloud Finale Songwriter Sonar Home Studio
4	Visual-spatial	Paint Movie Maker MS Power Point Google Presentation Google Earth Google Maps
5	Kinesthetic	Flight Simulator Crosstrainer
6	Interpersonal	Gmail Google Forms Forums MySpace
7	Intrapersonal	Google Forms Google Calendar Blogs
8	Naturalistic	National Geographic EcoBeaker

As a result of using the appropriate software, each member of the project team adds the created material to the multimedia product of the group.

4. Carry out the general control and management of work of project groups in a class; help to present results of each group at the highest level, highlight the features of personal contribution and achievements of each participant.

Presentation and generalization of results of the project work is as important as its proper planning, according to the theory of multiple intelligence, because, firstly, it shows the teacher the correctness of determining the type of intelligence of each participant and the distribution of tasks within the group, and secondly, creates a situation of success for younger students, motivates them to further active creative work in school and extracurricular time.

The implementation of an educational multimedia project may combine reading a text describing, for example, local flowers (linguistic), viewing illustrations (spatial), listening to music about the plants under study (musical), working out statistical maps and tables listing the requirements for planting specific flowers (logical, mathematical and naturalistic), watching and creating one's own videos about the process of planting and care of flowers (body-kinaesthetic and naturalistic). For example, if you click on some nouns – the names of colours in the text, e.g., the word "rose", the monitor will display an illustration of the rose (spatial intelligence) along with the song (musical). By clicking on certain verbs, such as "plant", you can activate a video presentation about the process of planting a flower (body-kinaesthetic intelligence).

The fulfilment of such project task requires considerable intensification of the intra-personal intelligence. If the project is a group one, interpersonal intelligence is also

encouraged. Created presentations and other digital resources become valuable documents for students' educational development, which make up "electronic portfolios" that can be easily passed from one teacher to the next as part of a student's credible learning achievements.

4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The theoretical and practical study has established that the relevance of the issue of implementing multimedia projects at primary school is due to the reform of the educational system of Ukraine, the requirements of modern society, and regulations regarding the competences and learning outcomes of primary schoolchildren. The analysis of the existing research has revealed significant theoretical potential and practical experience in the use of information technology in the educational process, which has been accumulated by modern psychological and pedagogical science. At the same time, educational practice and research show that the methodological aspect of the issue is insufficiently studied, so there is a need to justify the various possibilities of using ICT at primary school, based on the achievements of modern psychological and pedagogical research.

H. Gardner's theory has been chosen as the theoretical basis that increased the effectiveness of implementing multimedia projects at primary school. The scientist has found that each person has many types of intelligence, which represent the specific ways of processing and interpreting information: verbal-linguistic, logical-mathematical, kinesthetic, visual-spatial, musical, intrapersonal, interpersonal, naturalistic. Each type of intelligence has its own characteristics, which are manifested in childhood and should be developed at this age.

The developed technology of implementing project-based multimedia learning at primary school, which is described in the article, takes into account the different types of intelligences defined in H. Gardner's theory. The correlation between younger students' types of intelligences and computer software / Internet resources aimed at their activation is suggested. The focus is on the use of multimedia educational projects, which allow creating optimal conditions for students with different types of intelligences in order to maximize their involvement and development of their skills, as the project work simplifies and individualizes the task of finding information, increases interest and motivates students to engage in learning activities in view of their psychological features, helps participants in the educational process to rationally plan their activities and better perceive and remember information. The developed technology of project-based multimedia learning of primary schoolchildren according to the theory of multiple intelligences involves the gradual implementation of the following stages: determining the dominant type (types) of intelligence of each student; forming groups (on the principle of homogeneity or heterogeneity) for the project depending on its purpose and objectives; providing each group with specific instructions on the purpose, objectives, content, and scope of the project work; carrying out the general control and management of project groups in the classroom; supporting the results presentation of each group's work at the highest level, highlighting the specifics of personal contribution and achievements of each participant.

We suppose that implementation of the technology will significantly increase the effectiveness of project-based learning at primary school, will help each student to identify their own abilities and interests. Further pedagogical research should be continued in the direction of working out multimedia projects aimed at the development of certain groups of skills within the integrated courses "Ukrainian language and reading" and "I am exploring the world" for students of the New Ukrainian School. In order to develop modern didactic tools based on H. Gardner's theory of multiple intelligences, it is necessary to meet the requirements of using in the educational process of primary school different types of

information and communication technologies, which will contribute to the empowerment of teachers and students in the educational process.

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УПРОВАДЖЕННЯ ТЕОРІЇ МНОЖИННИХ ІНТЕЛЕКТІВ У МУЛЬТИМЕДІЙНЕ ПРОЄКТНЕ НАВЧАННЯ В ПОЧАТКОВІЙ ШКОЛІ

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Анотація У статті обґрунтовано актуальність використання мультимедійного проєктного навчання в початковій школі. Представлено можливості застосування теорії множинного інтелекту Г. Гарднера для оптимізації та підвищення ефективності такої роботи. За цією теорією, кожна людина володіє певною кількістю відносно автономних інтелектів: словесно-мовним, логіко-математичним, наочно-просторовим, кінестетичним, музичним, міжособистісним, внутрішньоособистісним, натуралістичним. У кожної людини є свій інтелектуальний профіль, який визначається спадковістю та життєвим досвідом. Визначено сутнісні характеристики мультимедійного проєктного навчання, зокрема, акцентовано увагу на важливості ролі вчителя під час організації мультимедійного проєктного навчання в початковій школі. Критичний аналіз наукових теоретичних та практичних досліджень довів необхідність вивчення впливу інформаційно-комунікаційних технологій на дітей молодшого шкільного віку з різними типами інтелекту. У результаті емпіричного дослідження визначено взаємозв'язок між типами інтелекту та засобами ІКТ для навчання молодших школярів. Автори дослідження доходять висновку, що використання мультимедійних освітніх проєктів підвищує інтерес та мотивує учнів до занять навчальною діяльністю з урахуванням їхніх психологічних особливостей, допомагає учасникам навчального процесу раціонально планувати свою діяльність та краще сприймати і запам'ятовувати інформацію. У статті обґрунтовано технологію мультимедійного проєктного навчання дітей молодшого шкільного віку відповідно до теорії множинного інтелекту, яка визначає послідовність кроків учителя для ефективної організації мультимедійного проєктного навчання з урахуванням теорії множинного інтелекту Г. Гарднера. Кроки або етапи запропонованої технології охоплюють визначення панівних типів інтелекту кожного учня в класі; об'єднання учнів у гомогенні чи гетерогенні групи за типом інтелекту відповідно до мети і завдань мультимедійного проєкту; розподіл обов'язків у групі й організація роботи кожного учня з відповідним програмним забезпеченням чи інтернет-ресурсом; здійснення загального контролю за роботою проєктних груп і допомога в презентації результатів мультимедійних проєктів.

Ключові слова: початкова школа; проєктне навчання; теорія множинних інтелектів; програмне забезпечення; мультимедійний навчальний проєкт.

ПРИМЕНЕНИЕ ТЕОРИИ МНОЖЕСТВЕННОГО ИНТЕЛЛЕКТА В МУЛЬТИМЕДИЙНОМ ПРОЕКТНОМ ОБУЧЕНИИ В НАЧАЛЬНОЙ ШКОЛЕ

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Аннотация. В статье обоснована актуальность использования мультимедийного проектного обучения в начальной школе. Представлены возможности применения теории множественного интеллекта Г. Гарднера для оптимизации и повышения эффективности такой работы. По этой теории каждый человек обладает определенным количеством относительно автономных интеллектов: словесно-языковым, логико-математическим, наглядно-пространственным, кинестетическим, музыкальным, межличностным, внутриличностным, натуралистическим. У каждого человека есть свой интеллектуальный профиль, который определяется наследственностью и жизненным опытом. Определены сущностные характеристики мультимедийного проектного обучения, в частности, акцентировано внимание на важности роли учителя при организации мультимедийного проектного обучения в начальной школе. Критический анализ научных теоретических и практических исследований доказал необходимость изучения влияния информационно-коммуникационных технологий на детей младшего школьного возраста с различными типами интеллекта. В результате эмпирического исследования определена взаимосвязь между типами интеллекта и средствами ИКТ для обучения младших школьников. Авторы исследования приходят к выводу, что использование мультимедийных образовательных проектов повышает интерес и мотивирует учеников к занятиям учебной деятельностью с учетом их психологических особенностей, помогает участникам образовательного процесса рационально планировать свою деятельность и лучше воспринимать и запоминать информацию. В статье обоснована технология мультимедийного проектного обучения детей младшего школьного возраста согласно теории множественного интеллекта, которая определяет последовательность шагов учителя для эффективной организации мультимедийного проектного обучения на основе теории множественного интеллекта Г. Гарднера. Шаги или этапы предлагаемой технологии включают в себя определение доминирующих типов интеллекта каждого ученика в классе; объединение учащихся в гомогенные или гетерогенные группы по типу интеллекта в соответствии с целями и задачами мультимедийного проекта; распределение обязанностей в группе и организация работы каждого ученика с соответствующим программным обеспечением или Интернет-ресурсом; осуществление общего контроля за работой проектных групп и помощь в презентации результатов мультимедийных проектов.

Ключевые слова: начальная школа; проектное обучение; теория множественного интеллекта; программное обеспечение; мультимедийный учебный проект.