

# Information Technology of Education in the Light of Vincent Okon's Theory of Multi Sided Personality Learning

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## Abstract

The article reveals the Vincent Okon's theory of multifaceted learning of the personality, which is the didactic base of many educational subjects today and can create the base for studying the subject "Informatics" in the institution of general secondary education (hereinafter GSEI). In the context of the study vectors of the subject "Informatics" in GSEI, a structure of certain types of activities is proposed: direct and indirect assimilation of knowledge; learning by discovery (scientific education); learning through experience (formation of value orientations); training through a practical component (professional training and project training). The essence of four vectors of V. Okon's multifaceted personality education theory is summarized and the didactic structure of V. Okon's multifaceted personality education theory is presented. The didactic situation of studying the subject "Informatics" is singled out, which is a dynamic space and facilitates the interaction of the teacher and the student during the educational process and determines the formation of skills and motivation to study the subject. The results of a survey of 85 respondents are presented. The purpose of the survey was to determine didactic teaching methods for practical skills, taking into account the vectors of the practical component of profile and project training, which are most often used when teaching the subject "Informatics" by teachers of schools in Ukraine and the Republic of Poland. Methods using IT in teaching the discipline "Informatics" are disclosed in detail. According to the results of the study, it was proved that the use of information technologies in the educational process contributes to the development of cognitive, emotional and practical activity of the individual and is an opportunity for multifaceted education.

**Keywords:** *information technologies, Digital Twins, software, institution of general secondary education, theory of multifaceted personality education.*

## 1. Introduction

The theory of multifaceted personality learning, developed by Vincent Okone, is the didactic base of many educational subjects. The author's works on this topic have been translated in many countries, and not only in Europe. Also, we are observing first attempts to show its application in teaching informatics. The material presented below is a synthesis of achievements in this field. It includes:

- characteristics of the theory of multifaceted

personality education according to V. Okon;

- the structure of four learning vectors - the study of informatics in the light of V. Okon's theory;
- characteristics of educational situations in informatics, their types and goals;
- the structure of IT tasks as a structural link of educational situations and their characteristics.

The creator of the theory of multifaceted personality education is the famous teacher, Vincent Okon. As the author emphasizes, "The subject of this theory is the complex process of human development, which occurs under the influence of education, not only school teaching and learning" (Okon, 1996, p. 191).

Human development in the above context is understood as the development of individual students and the development of an entire generation – younger and older. Because the development of a person and generations is inextricably linked with the development of society. This determines its dynamics, dimensions of content, desired and realized values and progress in various areas.

The main hypothesis of this theory is: "personality is the gradual harmonization of the individual, main functions of which are knowledge of worldview and self, experience of social phenomena and values, change of worldview based on acquired knowledge" (Okon, 1996, p. 191).

A person develops through intellectual and emotional activity, which is expressed in a person's attitude to values, practical activity, which is aimed at the awareness of new values, and therefore, at the perception of new values in terms of the existing reality.

Three types of activity: intellectual, emotional and practical constitute the essence of the theory. Therefore, the task for the teacher is to give students the opportunity to express themselves in these types of activities and thereby support them in their personal development. The nature of these tasks is very important. The author of the theory points out that "each of these three types of activity should have as much influence as possible on the important centers of both hemispheres of the human brain. Therefore, the teacher needs to take into account the two-way perception of information by the student, namely: assimilation of new material through the creative activity of the individual.

Assimilation consists in giving the student the opportunity to get acquainted with the relevant achievements of science, art and technology, through the prism of one's own creativity and the integrative component of the three spheres – to give the opportunity to test and develop one's own abilities, talents and creative inclinations" (Okon, 1996, p. 192).

Taking into account the above, the theory of multifaceted learning of the personality developed by Vincent Okone, which today is the didactic base of many educational subjects, can create the base for studying the subject "Informatics" in the institution of general secondary education.

## 2. Literature Review

Philosophical works on the essence and role of work in the life of a person and society serve as the methodological and theoretical base of the research. Special attention in the works of I. Zyazyun (2011) was paid to the creativity of the individual, which, in his opinion, is the driving force of the development of the country and society as a whole.

Theories of the life path and socialization of a person were studied in the writings of V. Kremen (2011), where it is stated that civilizational changes oblige us to rethink and reevaluate the tasks of modern education, and education that ensures the development of the individual should be capable of responses that are adequate to the challenges of the time. V. Frankl (2011) emphasizes the inner world of the person and the ability to find meaning in any situation and under any conditions, to always remain human. E. Fromm (1976) emphasizes that the highest goal of all social activities should be human welfare and averting human suffering, that every person should be interested in energetic activity for the benefit of other people and should participate in it.

Theories of activity, activity and communication were studied in the studies of B. Sliverskyi (2017), L. Kolesnichenko (Kolesnichenko, Artyushina, Kotykova, et al., 2008), O. Nemesh (2017); theories of personality and its ontogenetic development are studied in the works of E. Erikson (1992), R. Kettel (1990), A. Maslow (1970); theories of professionalization – J. Holland (1987), O. Dubinina (Dobrovolskyi, Dobrovolskyi, Dubinina, 2021), O. Onats (2012); theories of general and special abilities – V. Gladusha (2014), A. Vysotska (2013); theories of the system approach – H. Dmytrenko (2015), V. Maslov (2008), V. Oliynyk (2001), K. Chałas (2001); didactic problems of introducing information and communication technologies into the GSEI educational process – O. Dubinina (2016), T. Burlaienko (Dubinina, Burlaienko, 2021), N. Bakhmat (Bakhmat, Sydoruk, 2019), T. Kravchynska (Kravchynska, Dubinina, Chałas, et al., 2022).

In addition, the issue of student learning and achievement of certain learning outcomes in the field of computer science and information and communication technologies was studied, such learning belongs to different levels of students' cognitive abilities, and therefore measuring knowledge can be a very difficult task (Dlab, Candrljic, Pavlic, 2021). The impact of ICT, the learning environment, and student characteristics as potential predictors of success in different countries were also considered, directly the sample covered 41 countries (Erdogdu, 2022).

As can be seen from works of the authors listed above, this topic is relevant and of great interest for further research.

## 3. Aims

The purpose of the study is to justify the methodological principles of using multifaceted personality training according to the theory of Vincent Okon during the teaching of the subject "Informatics" at GSEI.

## 4. Research methods

The pedagogical research under consideration has been carried out as part of the research work 0122U000096 (01/02/2022 – 31/12/2024) "Project management of the development of socio-economic and information systems in the conditions of digitalization" to be conducted in 2022–2024 by the Department of Public Administration and Project Management of the Educational and Scientific Institute of Management and Psychology of the University of Education Management of the National Academy of Educational Sciences of Ukraine. At the same time, the research under consideration has been carried as part of the scientific-practical study "Development of the information-analytical competence of the teacher in the conditions of transformational changes of society", headed by PhD O. Dubinina, (copyright certificate № 93490 of 10/28/2019). "Trends, risks and determinants of the socio-economic development of the organization in the conditions of digital transformation" of the GDR 0121U114199 (03/01/2021 – 03/30/2025) PhD supervisor T. Burlaienko.

In the research process, number of methods were used which correspond to the goals of the research, namely: theoretical (analysis of scientific, pedagogical and methodical literature; analysis, synthesis, abstraction and systematization of content, forms and methods of organizing work with GSEI pedagogical workers, generalization of research results to determine modern approaches to information provision of GSEI education quality management); empirical methods (generalization of pedagogical experience, testing, observation, interviewing, survey, discussion; observation of activities of the GSEI

pedagogical team, questionnaires of teachers, managers; modeling of various situations, methodological measures to substantiate the state of practice of managing the quality of GSEI education in Kyiv using ICT); experimental methods (pedagogical experiment, processing of research results using the Microsoft Excel program for the systematization of research results and substantiation of modern approaches to information support for GSEI education quality management).

## 5. The results and discussion

The harmonious development of the student during the educational process is ensured / "dictated" by results of research in the field of physiology. Research by American neurologists Roger Sperry and Joseph Bogan confirmed the essential importance for the development of the right hemisphere of the human brain (Okon, 1996, p. 196). The right hemisphere of the human brain controls the work of the left half of the body, including the left hand; direct the perception of space, a holistic approach to various issues, intuitive, imaginative and spatial thinking, as well as the complex of cognitive, emotional and artistic interests. The left hemisphere controls the right half of the body, including the actions of the right hand and the localization of speech messages. The fact that the right hemisphere determines intuitive, metaphorical, and holistic processes puts it on a par with the left hemisphere, which produces linguistic and mathematical processes. Both hemispheres function mutually complementing each other. Their harmonious cooperation is a condition for full human development.

As V. Okon emphasizes, citing the research of neurologists, "the perceptual functions of the right hemisphere are, in fact, an important factor in the reproduction of non-verbal and verbal information. It is due to the fact that this information is supported by the work of the left hemisphere. And it is verbal information that allows a person to be intelligent, rational and analytical, while non-verbal information contributes to his intuitive, synthetic and holistic processes" (Okon, 1996, p. 193).

The second source of the theoretical prerequisites of the theory of multifaceted education is modern psychology, which "considers a person as a harmoniously developed individual who is able to: learn about the world, feel, act, realize his own "I" and embodies in himself the integration link between society and culture" (Okon, 1996, p. 194).

V. Okon, believes that activity at three main levels (cognitive, emotional, practical) is "...a way of "building" a complete personality, which is able to learn about the world, realize values, and change the world. At the same time, a creative person (homocreator) who, getting to know reality more and more deeply, evaluating and changing it, at the same time becomes the author of new and original solutions,

valuable results in the sphere of social and economic life, in the field of technology, science and art" (Okon, 1996 p. 197).

According to V. Okon, multifaceted education is a type of education in which students under guidance of a teacher or independently use various methods and tools, including learning by obtaining knowledge from various sources and discovering new information by solving various problems. According to the author, three fundamental components of multilateral education are the dynamics of the development of cognitive functions, the development of motivation and emotional life, the application of knowledge in various spheres of productive practice, which later become factors of pedagogical culture. According to the author, multifaceted education, which is built on four vectors of learning (Okon, 1967, p. 82–95), which are constantly integrated with each other, is of great importance in the development of the individual, namely: direct and indirect assimilation of knowledge; learning by discovery (scientific education); learning through experience (formation of value orientations); training through a practical component (professional training and project training).

1. Direct and indirect assimilation of knowledge. The subject of direct knowledge of reality is the world and processes taking place in it, i.e., nature, social life, culture and economy. This approach assumes the nature of the sources of knowledge, the selection of things, processes, phenomena, events, as well as connections and dependencies that arise between them and are learned depending on the opportunities in natural conditions and situations. They should be a tool for the development of imagination and the base of generalized knowledge about the world. General knowledge obtained in this way becomes the base for mediated knowledge of the abstract nature (Okon, 1996, p. 199). It is about the fact that direct and indirect knowledge should be stimulated by teacher with various didactic situations and forms that are selected by the teacher and students, taking into account: comprehensive use of the school environment as a source of stimuli; selection of more attractive sources of "ready" knowledge; use of methods of assimilation of knowledge, which contribute to their memorization (acquisition), prolongation of the time of retention in memory; use of effective methods of "consolidation" of knowledge by appropriate return to previously learned content and applying them in action; self-control and control of knowledge acquisition (Okon, 1996, p. 200).

The educational situation, which is often called didactic, is the main link of the educational process. According to V. Okon, "didactic is a part of the educational process, which can be considered as a kind of whole, including: the activity of students and the teacher, the presence of external and internal conditions and their

changes; the didactic situation is aimed at changing the worldview of students and forming certain values in them in accordance with the intended goals of education and upbringing” (Okon, 2004, p. 394).

It should be emphasized that the development of mental abilities, mainly imagination and convergent and divergent thinking, occurs by solving problems, that is, perceiving, formulating, inventing, constructing ideas, solving them, checking the truth of decisions and evaluating effects of the decision. Therefore, in our opinion, didactic situations should be used in education, which give the student the opportunity to learn about the world independently, involving his own efforts in solving various problems.

2. Learning through discovery (scientific education). Learning through discovery is integrally related to learning through direct and indirect assimilation of knowledge, which is often the first condition for discovering a new reality by solving problems of a theoretical, laboratory-research and practical nature. Both of the above-mentioned ways of learning are an important factor and source of acquiring and assimilating knowledge, developing cognitive abilities, including: thinking, observation, imagination, attention, memory. Also, the combination of the mentioned ways of learning contribute to the development of many personal qualities, such as: reliability, entrepreneurship, creativity, sense of justice (1996, Okon, p. 202).

3. Learning through experience (formation of value orientations). The theory of multifaceted personality education emphasizes the role and importance of the development of the emotional sphere in the educational process – emotional attitudes and culture as a whole. As the author emphasizes, “these goals are also served by the concept of multifaceted education, according to which learning through experiences should contribute to the emotional state of students. Learning through experience is the creation in the educational environment of such situations in school and extracurricular work in which students have emotional experiences – under the influence of which values are formed, in particular with the help of literary works, theatrical art, cinema, painting, works of architecture, music arts, etc...” (Okon, 1996, p. 203). According to the author, the formation of the above-mentioned values and their sources of experience becomes the base for evaluation, which involves the development of emotional life and commitment to worthy actions. The main consequences of this method of learning are the subject's deep awareness of the learned content, the awakening of feelings, the formation of altruistic attitudes – serving the interests of others and others, increasing emotional maturity, developing assessment skills (Okon, 1996, 203–204).

4. Training through a practical component (professional training and project training). The activity and practical orientation lead to the creation of educational

situations in which student is faced with the task of solving practical problems in the field of technology, production, and social life, the solution of which leads to the transformation of reality. Solving the above-mentioned tasks leads to knowledge, development of various types of practical skills, organizational and technical abilities, creative attitude, and, above all, the ability to act during the performance of specific tasks. Learning by practice helps to combine theory with practice, during which skills and habits are mastered, knowledge is expanded and consolidated; an opportunity to formulate and creatively solve practical and theoretical problems is created.

The result of using the specified method of education is the development of strong will and character, as well as other traits, such as: honest attitude to work, respect for work, respect for a working person, recognition of creativity. (Okon, 1996, p. 205–206; Chałas, 2001, p. 27–30).

Summarizing the essence of the four vectors of V. Okon's multifaceted personality education theory, we will present the didactic structure below in the Table 1.

Table 1: Didactic structure of the theory of multifaceted personality education by V. Okon

<i>N<sub>o</sub></i>	<i>A variety of activities/action</i>	<i>Learning vectors</i>	<i>Didactic teaching methods</i>
1	Intellectual	Direct and indirect assimilation of knowledge (1); Learning through discovery (science education) (2).	Traditional; Problematic
2	Emotional	Learning through experience (formation of value orientations) (3).	Visually
3	Practical	Training through the practical component (professional training and project training) (4).	Practical

Summarizing the data in the Table 1 and the purpose of the study outlined by us, the question arises: can this V. Okon's theory, the multifaceted education of the personality creates a didactic base for the formation of key competencies of students during the teaching of the subject “Informatics” at GSEI? As already emphasized above, V. Okon's theory of multifaceted personality education of is one of the key didactic elements according to which, there are four learning vectors that reflect the integration component of activities including practicing activities through the prism of the application of didactic methods.

Taking into account the problem of our research, we suggest to focus on the application of the multifaceted training of personality when studying the subject “Informatics” at GSEI. The analysis of scientific and methodical literature in view of the investigated problem (Miterka, 2018) indicates that

- the intellectual activity will be manifested in the

acquisition and discovery of knowledge in all areas of the development of information literacy of the individual, through the introduction of information and communication technologies (ICT) into the educational process, which allow active use of digital learning methods;

- the emotional activity is vulnerable due to the formation of value on the basis of the digital development of society and threats arising from the active use of the Internet space by the younger generation;

- the practical activity leads to learning the reality of the world, both the modern reality of the existence of an individual and the virtual world, as one of the components of the existence of humanity, through the practical activity of students through the presentation of the formed level of information literacy and culture.

Taking into account the four vectors of learning according to the theory of V. Okon, modern researchers believe that the methodology of teaching the subject “Informatics” at GSEI should include:

- “Learning by receiving ready-made ICT messages using many sources, in particular mass media; knowledge of the surrounding, real and virtual reality using information and communication technologies;

- learning by identifying and explaining the causes of observed processes and tasks of finding ways to influence their course;

- learning through experience, that is, emotional involvement of the student in the activity of obtaining, evaluating the construction of information and constructing knowledge and own products, experiencing the value of knowledge;

- learning through practical activity, i.e., effective use of ICT tools and tools during actions leading to changes in the environment and acquisition of IT skills” (Miterka, 2018, p. 23).

In the context of the above-mentioned vectors of learning the subject “Informatics” at GSEI, E. Miterka offers the following structure of individual types of activities/activities:

#### 1. Direct and indirect assimilation of knowledge:

- the presentation and development of new content in the field of ICT;

- the integration of new information with previous information and its systematization;

- the consolidation of new content/information by trying to apply it in new situations.

These measures concern the teacher and students. They must be integrated with each other.

#### 2. Learning through discovery (scientific education):

- creation (by a teacher or a student) of a problem situation and formulation of problematic issues in the field of ICT or decision-making using computer and digital technologies;

- finding ways to solve the problem by implementing planned measures;

- testing of theoretical and practical solutions using ICT tools;

- systematization of the acquired knowledge and its consolidation through application in one's own scientific research.

#### 3. Learning through experience (formation of value orientations):

- joint construction of appropriate hierarchical structures of values;

- inspiration for the creative activity of students in the use of digital and information and communication technologies.

#### 4. Training through the practical component (professional training and project training):

- familiarization with the task execution algorithm

- development of a task performance model;

- presentation of the results of the task;

- action tests;

- the teacher's control over the results of the students' performance of the task;

- performing exercises to consolidate acquired practical skills (2018, Myterka, p. 29–30).

Based on the analysis of the content of teaching the subject “Informatics” in general secondary education institutions of the Republic of Poland, E. Miterka (2018) identifies the following types of situational tasks:

- cognitive-operational – safe use of a computer and its software, use of a computer network and the Internet;

- information and computing – communication using a computer, information and communication technologies; search and use of information from various sources; joint creation of resources in the school network;

- visualization of effects – computer processing of drawings, texts, numerical data, animations, presentations;

- problem solving – solving problems and making decisions using a computer and an algorithmic approach;

- experimental and research – use of the computer and educational programs, games for deepening knowledge and skills in various fields;

- cognitive and presentational – the use of computers and information and communication technologies in order to motivate students to acquire new knowledge in various fields; development of mobile applications (Miterka, 2018, p. 87–89).

So, according to the analysis of scientific research by V. Okon (1967, 1996, 2004) and E. Miterki (2018), the educational situation should be integrated into the content of the educational process, this is especially important while studying the subject “Informatics” at GSEI.

In our opinion, in the given context, the concept of the didactic situation in the teaching of informatics can be defined as a basic structural element of the didactic-educational process of the subject, which includes: the activity of the teacher, which is integrally connected with

the activity of students and determined by the types of IT tasks; interpersonal relations aimed at organizing computer science lessons.

Thus, the didactic situation for studying the subject "Informatics" is a dynamic space that facilitates the interaction of the teacher and the student during the educational process and determines the formation of skills and motivation to study the subject.

After conducting a screening of scientific and methodical literature on the use of didactic situations in the educational process, in particular, teaching the subject "Informatics" at GSEI, based on the method of multifaceted training of the personality according to V. Okon, we developed a questionnaire and introduced it through electronic resources.

The purpose of the survey was to determine didactic teaching methods for practical skills, taking into account vectors of the practical component of profile and the project training, which are most often used while teaching the subject "Informatics" by teachers of schools in Ukraine and the Republic of Poland.

Eighty-five respondents were involved in the survey. The interviewees were offered the following basic questions that reflected the application of didactic methods according to the 4-vector component of V. Okon's methodology.

1. To which of the four vectors of Vincent Okon's multifaceted personality learning theory are you inclined?

2. Which type of activity / practical activities according to Vincent Okon's multifaceted personality learning theory is the most effective in teaching the subject "Informatics" at GSEI?

3. What practical skills do you want to develop in your students in Informatics classes?

4. What, in your opinion, primarily depends the choice of the methodology of practical direction in the Informatics classes?

5. Which of the methods proposed below, in your opinion, are the most attractive and effective for teaching in Informatics classes?

The survey results will be distributed as follows:

- 69,4 % of respondents believe that they are most inclined to study through the practical component (profile training and project training) / the path through practical action (profile and project training);

- 76,2 % of respondents determined that practical activity is the most effective in teaching the subject "Informatics" at school;

- 21,2 % of respondents believe that in the "Informatics" classes, teachers should form students' practical skills and the ability to learn throughout life, and only 2,4 % of respondents believe that it is necessary to form students' moral and ethical principles in computer science classes. Although each of the respondents noted that the teacher in the "Informatics" lesson should form such

practical skills in students as: critical thinking, the ability to make appropriate decisions independently, the ability to change the world around them, the digital literacy and the ability to work independently with technical means and sources of information;

- 18,1 % of the respondents believe that the choice of the methodology of practical direction in the lessons of Informatics depends on the material and technical base;

- 24,7 % of respondents believe that mobile applications are the most attractive and effective for teaching in Informatics classes.

Monitoring of research results is shown in Table 2.

Table 2: Monitoring of research results regarding the definition of didactic teaching methods used in teaching the subject "Informatics" by GSEI teachers of Ukraine and the Republic of Poland in accordance with V. Okon's method of multifaceted personality training

<i>Question</i>	<i>Answer options</i>	<i>%</i>
Which of the four vectors of Vincent Okon's multifaceted personality learning theory are you prone to?	direct and indirect assimilation of knowledge	5,9
	learning by discovery (science education)	12,9
	learning through experience (formation of value orientations)	11,8
	training through a practical component (professional training and project training)	69,4
What type of activity according to the theory of multifaceted learning of the personality of Vincent Okon is the most effective in teaching the subject "Informatics" at GSEI?	intellectual activity	11,9
	emotional activity	11,9
	practical activity	76,2
What practical skills do you want to develop in your students in Informatics classes?	critical thinking	8,2
	moral and ethical principles	2,4
	the ability to make responsible decisions independently	9,4
	the ability to change the surrounding world	14,1
	to learn throughout life	21,2
	IT competence	14,1
	high level of information culture	10,6
	digital literacy	14,1
What, in your opinion, depends primarily the choice of the methodology of practical guidance in Informatics classes the GSEI	ability to work independently/self-development/self-improvement	16,5
	to learn throughout life access to the Internet	18,1
	access to the Internet	12,0
	opportunity to present achievements content component of the educational subject	8,4
	content component of the educational subject	12,0
	task design	7,2

	the possibility of improving the work program on the subject	8,4
	mandatory tasks in terms of requirements	6,0
	students have the necessary skills for independent work	27,2
Which of the methods proposed below, in your opinion, are the most attractive and effective for teaching in Informatics classes criterion kaleidoscope	“Scribing”	9,4
	using mobile applications	24,7
	criterion kaleidoscope	5,9
	Digital Twin	14,1
	neurographics	3,5
	“Post-session”	2,4
	Disney method	7,1
	Edward de Bono methods	6,9
	“The World Cafe”	4,7
	“Case”	4,7
	WebQuest	17,6

Analyzing Table 2, it is possible to highlight the following main didactic teaching methods used in the teaching of the subject “Informatics” by GSEI teachers of Ukraine and the Republic of Poland and integrated through multi-faceted training of the individual according to V. Okon’s methodology, in particular through the implementation of practical activities, using information technology tools and leads to achieve the set goal (Fig. 1).

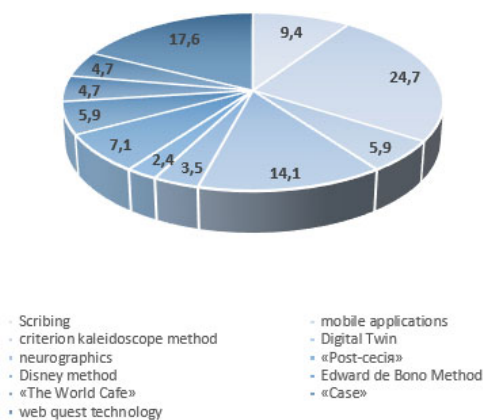


Fig. 1. Analysis of methods that are the most attractive and effective for teaching in informatics classes and are implemented with the help of information technologies.

Let us consider in more detail methods proposed by teachers using IT in teaching the discipline “Informatics”.

The CASE (Computer-Aided Software Engineering) method is a set of programming tools and methods for designing software, which helps to ensure high quality of programs, absence of errors and ease of maintenance of software products.

Software Engineering Tools (CASE): Software Requirements Tools; design tools (Software Design Tools);

tools for creating and verifying software design (SADT/IDEF, UML, BPMN/BPEL, Microsoft DSL, etc.); construction tools (Software Construction Tools).

All of the above tools are used to show a software representation (e.g., source code).

Digital Twin – technology of Digital Twins (DT-technology). The Digital Twin concept is a convergence of the physical and virtual worlds, where each object receives its dynamic digital representation (imprint). The DT toolkit includes powerful components such as Big Data, Internet of Things, Machine Learning and Artificial Intelligence, which are mostly used in industry. Wide access and use of the specified toolkit have made DT more profitable and accessible to the business world, including, in our view, to the educational sector.

The “Post-session” method is a poster presentation at a conference/class with an academic or professional orientation and is a presentation of research information in the form of a digital poster that can be viewed by conference/class participants.

“The World Café” method is a method that allows you to organize a live discussion using digital technologies, which is focused on informal discussion. This technique is a valuable helper when it is necessary to gather information in a group of people, exchange knowledge and experience, freely share ideas and opinions, hear what others think about issues relevant to the community.

The World Cafe method allows you to involve each participant in the conversation, creating a comfortable atmosphere of openness, ease and psychological safety, the advantage of this method is that it can be used during distance learning with the help of IT.

The Disney method is a method of creativity, which is carried out in the form of a role-playing game, in which participants consider the task from three points of view: creative, realistic and critical. It is named after the American animator Walt Disney. The author of the technique is Robert B. Dilts (Dilts, 1994).

So, summarizing the above, among the didactic teaching methods used in the teaching of the subject “Informatics” by teachers of the GSEI of Ukraine and the Republic of Poland and integrated through multi-faceted training of the individual according to V. Okon’s methodology and the use of IT, we single out the following: Web-quest, Digital Twins, Post-session, The World Cafe, Disney method, mobile educational applications, etc.

## 6. Conclusions and prospects for further research

Summarizing the results of the study, we can say that the use of information technologies in the educational process contributes to the development of cognitive, emotional and practical activity of the individual and is an

opportunity for multifaceted education.

V. Okon defines a task as a situation “in which there is a need or necessity to overcome certain difficulties, causing a specific action, the consequence of which is some achievement in the material sphere or in the sphere of values” (Okon, 2004, p. 459).

A more extended and detailed definition is given by B. Kvyatkovska-Koval. In her opinion, “the task is a certain structure of the whole, the individual elements of which require assimilation, design, substantiation of the activity program and prediction of possible results of project implementation, should constitute a certain sequence of logical and actual decision-making. Each completed task consists of four stages:

- the recognition of the task situation;
- the determination of measures that lead to its solution;
- the meaningful justification of the choice of types of activities that will contribute to the solution of the task. There must be consistency between different phases” (Kvyatkovska-Koval, 1992, p. 42).

The question arises: how can you define a didactic IT task, a task that is set in computer science classes?

E. Miterka defines a didactic task in informatics as follows: “this is an event caused by a situation, based on tasks, the essence of which is the content of an educational discipline, a content-based activity, with the use of IT tools and leads to the achievement of the set goal” (Miterka, 2018, p. 98).

In the above context, the structural elements of the didactic task in the discipline “Informatics” are:

- purpose;
- analysis of conditions;
- preparation for the task (substantive and technical training);
- action planning;
- performance of the task;
- presentation of achievements/results;
- assessment of activity in the context of the intended goal.

In the light of the theory of multifaceted training of the personality according to the methodology of V. Okon, we can distinguish the following categories of didactic tasks from the discipline “Informatics” based on the four vectors of this methodology (Table 3).

Table 3: The didactic structure of informatics in the light of V. Okon’s theory according to the research results

Teaching methods	Educational goals	A variety of activities
through assimilation	output control	intellectual activity
through discovery / scientific research	experimental and research	intellectual activity integrated with practical activity
through experience	formation of value guidelines	emotional activity

through the practical component	ability to use software tools and IT in the implementation of projects	practical activity
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One of the requirements for educational goals students is programming skills. Among them we highlight:

- creative design of the project;
- the ability to choose and use appropriate software tools, for example (Computer-Aided Software Engineering);
- the ability to choose and use appropriate electronic resources (electronic libraries, frameworks, design templates);
- adherence to specifications and compliance with programming requirements;

- writing code.

In the above context, it is possible to highlight the main tasks of using IT in lessons in the discipline “Informatics”:

- design;
- constructiveness;
- coding tasks: writing the correct code; writing quality code; writing universal and flexible code.

The choice of tasks cannot be random. It should take into account the systematic fulfillment of IT requirements, the level of development of students’ competencies and interests, latest achievements in the field of informatics.

Also, we would like to note that among the effective didactic teaching methods used in the teaching of the subject “Informatics” and integrated through the multifaceted training of the individual according to V. Okon’s method and the use of information technologies by GSEI teachers of Ukraine and the Republic of Poland, the following are highlighted: Web-quest, Digital Twins, Post-session, The World Cafe, Disney method, mobile educational applications, etc.

## References

[1] Bakhmat, N., Sydoruk, L. 2019. Formation of modern ideas about the adaptive educational environment of the institution of higher education. *Educational space of Ukraine*, 15, 17–25. <https://doi.org/10.15330/esu.15.17-25>.

[2] Cattell, R. 1990. The birth of the Society of Multivariate Experimental Psychology. *Journal of the History of the Behavioral Sciences*, 26, 48–57.

[3] Dilts, R. 1994. Strategies of Genius.

[4] Dlab, M., Candrljic, S., Pavlic, M. 2021. Formative Assessment Activities to Advance Education: A Case Study. *Journal of Information Technology Education: Innovations in Practice*, 20, 37–57. <https://doi.org/10.28945/4758>.

[5] Dmytrenko, G. 2015. Eco-human centrism as a fundamental basis of nation consolidation. *Viche*, 22, 15–17.



- [6] Dobrovolskyi, Y., Dobrovolskyi, V., Dubinina, O. 2021. The technology of planning and supporting the professional career of a young teacher of a higher military educational institution in the system of continuous education. *Bulletin of postgraduate education. "Pedagogical Sciences" Series*. 17(46), 25–42. [Online]. Available : [http://umo.edu.ua/images/content/nashi\\_vydanya/visnyk\\_P\\_O/17\\_46\\_2021/pedagog/Bulletin\\_17\\_46\\_Pedagogika\\_Yu.D\\_obrovolskyi\\_V.Dobrovolskyi\\_O.Dubinina.pdf](http://umo.edu.ua/images/content/nashi_vydanya/visnyk_P_O/17_46_2021/pedagog/Bulletin_17_46_Pedagogika_Yu.D_obrovolskyi_V.Dobrovolskyi_O.Dubinina.pdf). Accessed on: 05/08/22.
- [7] Dubinina, O., Burlayenko, T. 2021. Informational support of quality management in educational institutions of Ukraine Economic-legal discussions. *Materials of the 2nd International Scientific and Practical Internet Conference of Students, Postgraduate Students and Scientists*, 208–212.
- [8] Dubinina, O. 2016. Methodology of using information systems and technologies in the activity of a teacher of an educational institution: methodological recommendations.
- [9] Erdogdu, F. 2022. ICT, learning environment and student characteristics as potential cross-country predictors of academic achievement. *Educ Inf Technol*, 27, 7135–7159. <https://doi.org/10.1007/s10639-021-10848-x>.
- [10] Erickson, E. 1992. The complete life cycles.
- [11] Frankl, V. 2011. Man's Search for Meaning: The classic tribute to hope from the Holocaust.
- [12] Fromm, E. 1976. To Have or to Be?
- [13] Gladush, V. 2014. Peculiarities of the formation of the image of the correctional teacher profession. *The image of a modern teacher*, 4, 3–7.
- [14] Holland, J. 1987. Making vocation choices: A theory of vocational personalities and environments.
- [15] Khalas, K. 2001. Pedagogic gymnasium.
- [16] Kravchynska, T., Dubinina, O., Chalas, K., Burlaenko, T., Tymoshko, A., Sholokh, O. & Vinichenko, A. 2022. The Usage of Automated Information Systems for Database Management in General Secondary Education Institutions of Ukraine. *International Journal of Computer Science and Network Security*, 22(5), 497–506. <https://doi.org/10.22937/IJCNS.2022.22.5.69/>.
- [17] Kremen, V. 2011. Philosophy of human-centeredness in the educational space.
- [18] Kolesnichenko, L., Artyushina, M., Kotykova, O. and others. 2008. Psychology and pedagogy: study guide.
- [19] Kwiatkowska-Kowal, B. 1992. The concept of the task of pedagogical education in universities.
- [20] Maslov, V. 2008. Modelling in theoretical and practical activities in pedagogy. *Postgraduate education in Ukraine*, 1, 3–9.
- [21] Maslow, A. 1970. Motivation and Personality.
- [22] Miterka, E. 2018. The structure of educational situations in the teaching of computer science and student achievement.
- [23] Nemesh, O. 2017. Psychology of communicative activity in the Internet space. [Online]. Available : [http://psychology-naes-ua.institute/files/pdf/dis\\_nemesh1\\_1509217152.pdf](http://psychology-naes-ua.institute/files/pdf/dis_nemesh1_1509217152.pdf). Accessed on: 05/08/22.
- [24] Okon, V. 1967. Fundamentals of general education.
- [25] Okon, V. 1996. Introduction to general didactics.
- [26] Okon, V. 2004. New Pedagogical Dictionary.
- [27] Oliynyk, V. 2001. Pedagogical education system and pedagogical innovations. *Director of the school, lyceum, gymnasium*, 4, 61–69.
- [28] Onats, O. 2012. Self-realization of the innovative management potential of the head of the ZNZ. *Ways of education*, 3, 24–29.
- [29] Sliverskyi, B. 2017. Educator of the future. *Education*, 6, 8–19. <https://doi.org/10.28925/2226-3012.2017.6.819>.
- [30] Vysotska, A. 2013. Media education as a direction of the educational process in preschool and general educational institutions. *Proceedings. Series: Pedagogy*, 3, 70–73.
- [31] Zyazyun, I. 2011. Pedagogical scientific research in the context of a holistic approach. *Comparative Professional Pedagogy*, 1, 19–30.

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