N. VOLKOVA,
Doctor of Pedagogical Sciences, Professor,
Head of the Department of Innovative Technologies in Pedagogy, Psychology and Social work,
Alfred Nobel University, Dnipro

I. OLIINYK,
PhD in Pedagogy,
Associate Professor at the Department of Innovative Technologies in Pedagogy, Psychology and
Social Work, Alfred Nobel University, Dnipro

M. KARPOVA,
PhD in Pedagogy,
Senior Lecturer at the Department of Innovative Technologies in Pedagogy, Psychology and
Social Work, Alfred Nobel University, Dnipro

STRATEGIC COMPETENCE AS A GUARANTEE OF PROFESSIONAL ACTIVITY OF A MODERN IT SPECIALIST

The article is devoted to the problem of forming the strategic competence of an IT specialist, which is a personal integrative entity. This represents the unity of professionally significant qualities, knowledge and skills, with the help of which specialists formulate the strategic goal of work, show a value-motivational attitude to strategic changes and flexibility in behaviour depending on the factors of the external environment, carry out an adequate choice and implementation of strategies depending on the situation, while achieving the effectiveness of the professional activity. The importance of the formation of strategic competence in three main sections is substantiated: elemental (a set of components, the interaction between which ensures the implementation of the relevant activity); functional (methodology for adopting strategies); procedural (technology for developing and implementing a strategy in the existing environment).

It has been proven that a high level of IT specialists' strategic competence ensures the following: determination of the leading goal of professional activity, choosing an effective model of professional behaviour following existing conditions, planning and development of measures for adaptation to conditions of professional activity, implementation of planned professional actions and operations (strategies), etc.

The article also presents the main aspects of professional training of future IT specialists. The experience of organizing and implementing university training for future IT specialists shows that a high level of strategic competence makes it possible to choose and prepare the right hardware and software, rational methods for solving professional tasks, allows for the modernization of IT infrastructure, optimization of IT efficiency for innovation. This makes it possible to manage the IT sector, in particular, in the context of IT infrastructure management, IT projects, IT costs, to increase the security and stability of the industry. It is important to define long-term goals, taking into account the phased process of optimizing existing IT systems.

Keywords: strategic competence, strategy, information technology, professional training IT specialist.

Волкова Н.П., Олійник І.В., Карпова М.Є. Стратегічна компетентність як запорука професійної діяльності сучасного ІТ-фахівця

У статті розглянуто актуальну проблему професійної підготовки майбутніх фахівців ІТ у контексті формування стратегічної компетентності, адже для ефективної реалізації в професійній діяльності випускникам університетів у галузі ІТ критично важливо вміти стратегічно планувати дії різними шля-

хами. Стратегія професійної діяльності реалізується за допомогою окремих тактичних дій, які у сукупності становлять стратегічну діяльність. Отже, сформованість стратегічної компетентності дозволяє фахівцю галузі ІТ зрозуміти, які саме дії є найбільш вагомими для реалізації мети та досягнення професійних завдань.

Установлено, що стратегічна компетентність ІТ-фахівця є особистісним інтегративним утворенням. Це єдність професійно значущих якостей, знань і вмінь, що уможливлює формулювати стратегічну мету та завдання діяльності, виявляти ціннісне та мотиваційне ставлення до змін діяльності і мобільності у поведінці відповідно до зовнішніх факторів, здійснювати раціональний вибір та реалізацію стратегій згідно з наявною ситуацією задля досягнення ефективності професійної діяльності. Обґрунтовано вагомість формування у студентів стратегічної компетентності відповідно до трьох напрямів: елементного (сукупність компонентів, взаємодія між якими дозволяє здійснити діяльність у галузі ІТ); функціонального (теорія прийняття відповідних стратегій); процедурного (технологія розробки та реалізації стратегії в галузі ІТ).

Доведено, що високий рівень сформованості стратегічної компетентності фахівця галузі ІТ уможливлює таке: правильне розуміння та визначення стратегічної мети професійної діяльності; вибір дієвої моделі професійної поведінки відповідно до умов зовнішнього середовища; планування, обґрунтування та розробка заходів щодо адаптації до умов професійної діяльності; виконання запланованих професійних дій та операцій (стратегій); мобільна реакція на проблеми галузі ІТ; оцінювання поточних і перспективних результатів роботи ІТ-фахівця.

У статті також подано основні аспекти професійної підготовки майбутніх ІТ-фахівців. Досвід організації та реалізації університетської підготовки майбутніх ІТ-спеціалістів показує, що високий рівень стратегічної компетентності дає можливість правильно обирати та готувати апаратне та програмне забезпечення, раціональні методи вирішення професійних завдань, дозволяє модернізувати ІТ-інфраструктуру, оптимізувати ефективність використання ІТ. Це дозволяє управляти ІТ-сектором, зокрема в контексті управління ІТ-інфраструктурою, ІТ-проєктами, ІТ-витратами для підвищення безпеки та стабільності галузі. Важливо також уміти визначати довгострокові цілі з урахуванням поетапного процесу оптимізації існуючих ІТ-систем.

Вагомий наголос робиться на такі блоки наукових знань: використання технологій і алгоритмів обчислювального інтелекту та інтелектуального аналізу даних в задачах прогнозування, аналітики, кластерного аналізу з використанням програмних інструментів підтримки багатовимірного аналізу даних на основі технологій DataMining, TextMining, WebMining, оволодіння мовами системного програмування та методами розробки онлайн програм, виконання паралельних і розподілених обчислень, застосування чисельних методів та алгоритмів тощо.

У статті також наведено перспективні напрями дослідницьких пошуків як вивчення реального стану сформованості стратегічної компетентності майбутніх бакалаврів галузі ІТ.

Ключові слова: стратегічна компетентність, стратегія, інформаційні технології, професійна підготовка ІТ-фахівців.

Statement of the problem. To achieve success in professional activities in the field of information technology, a specialist needs to be able to strategically plan his actions in different ways, that is, with the help of tactics. Therefore, the strategy of professional activity can be implemented through certain tactical actions. Therefore, the formation of strategic competence allows the specialist to trace which actions are the most effective in achieving the goal of professional activity.

Analysis of the recent research. Theoretical and methodological aspects of the implementation of specialists' strategic activities have become the subject of research by several scientists (S. Chernov, O. Gangur, N. Gudz, M. Kalnytska, P. Khvostenko, G. Mintzberg, J. Quinn and others). Some aspects of strategy in professional activity are revealed by scientists (O. Kashekova, N. Kuzmych, O. Malova, M. Oliyar, V. Popeliushko, L. Slyva and others). The problem of the formation of strategic competence is the subject of research by scientists (O. Gubareva, L. Kaidalova, T. Lyakh, A. Markova, G. Mirskikh, E. Pavliuk, O. Parzhnytskyi, V. Sayuk, N. Serhiienko, O. Sytnyk, T. Spirina Yu. Zinkovsky and others).

Along with sociology, philosophy, management, philology, strategies and tactics, we consider in the context of pedagogical sciences: the strategy for building open education in the European space (O. Lokshyn); strategy and tactics of the state policy of Ukraine in the field of general secondary education (N. Dichek); strategy of changes in the professional training of the future primary school teacher (R. Prima); strategy and tactics of modernization in higher education (A. Shcherbyna); strategy and tactics of the state of social integration of youth with disabili-

ties (T. Martyniuk). In addition, several dissertation studies on the formation of strategies were carried out: communicative (Yu. Romanenko), linguistic (O. Vanivska), linguodidactic strategies (O. Lyubashenko), as well as strategic foreign language competence (N. Bilonozhko, N. Shcherba).

The purpose of the study. The purpose of the article is to substantiate the importance of strategic competence for the implementation of the professional activities of modern IT specialists, based on the analysis of scientific literature.

Presentation of the main study material. Dealing with the analysis of the most important results of scientific research on the training of future IT specialists, it should be noted that in the overwhelming number of scientific works, related terms are used: "computer science specialist", "information technology specialist", etc.

Today, most scientific research is devoted to the study of theoretical and methodological principles of IT bachelor's e-learning. Thus, the doctoral studies [O. Glazunova, 2014], [T. Vakalyuk, 2018] and others deserve attention. In the work [O. Glazunova, 2014], we find interesting the substantiated methodological, theoretical and methodological foundations for the design and application of the e-learning system of future information technology specialists in agricultural universities. Using the method of qualimetry, the author developed a factor-criteria model for the effective application of the e-learning system. In addition, the researcher identifies the factors of e-learning:

– readiness of students and teachers to use the e-learning system;

– cloud-based electronic educational environment, designed taking into account the specifics of training future IT specialists;

– availability of necessary software platforms to provide students with educational services in the e-learning system, etc.

T.°Vakalyuk theoretically substantiated and designed a cloud-oriented learning environment for the preparation of bachelor of computer science and developed a methodological system for its use [T. Vakalyuk, 2018]. We consider the approach to defining the leading concept of research to be interesting. Thus, under the cloud-oriented educational environment for the preparation of bachelor of computer science, the author understands the educational environment of a higher education institution, in which the didactic goals of preparing bachelor of computer science, as well as ensuring the cooperation of teachers and students, are achieved through the use of cloud computing technologies and services.

In addition, it is worth highlighting some studies, the results of which were the development of:

– models of using the training management system for the organization of combined training in-system programming of bachelor of software engineering (A.°Stryuk);

– methods of using distance learning technologies (I.°Gerasymenko);

– virtualization technologies of Unix-like operating systems (O.°Holovnya);

– technologies of professional training of bachelor of computer science at agrarian universities (G.°Onyshchenko), etc.

The next step is paying attention to the results of research on professional training within certain academic disciplines. Thus, U.°Kohut substantiated the methodology of using CMS (computer mathematics systems) as a means of teaching operations research of future computer science specialists, in particular: the principles of fundamentalization of teaching operations research using CMS are determined, a model for using CMS as a means of teaching operations research of future computer science specialists is developed, ways of improving the information and educational environment of higher education institutions using CMS are presented [U.°Kohut, 2015]. Some more scientific research should be taken into consideration. Thus, G.°Chemeris considered the foundations of computer design as a factor in the modernization of the content of professional education of future bachelors of computer science [G.°Chemeris, 2018], I.°Zinovieva presented the process of using open geoinformation systems in the training of students of this specialty [I.°Zinovieva, 2018], K.°Vlasenko presented the methodology for teaching the differential equations to future bachelors of computer science [K.°Vlasenko, 2018], etc.

As evidenced by the research results, a special bias is made on the use of a cloud-oriented educational environment and e-learning courses, which corresponds to the program results of the training.

The latter direction of the research is aimed at the formation of general and professional competencies of future bachelors of computer science.

Thus, T.°Vdovychyn substantiated and developed a model for the formation of competence of bachelor of computer science in the use of open systems' network technologies [T.°Vdovychyn, 2016]. K.°Osadcha investigated the process of forming graphical competence using three-dimensional modelling [K.°Osadcha, 2017].

In the scientific works of the listed scientists, it is proved that to form and increase the level of graduates' competence, it is necessary: to develop educational standards based on professional standards, taking into account professional competencies that should be consistent with the needs of IT companies; to make educational standards flexible, to quickly respond to changes in the IT industry and the labor market; to propose the educational standard to add a section «Needs of the modern IT market», which will allow taking into account the requirements of employers and changing depending on the situation in the IT market, etc.

There are two more works in which the emphasis is on the important competencies of the activities of bachelor of IT as the ability to learn and master modern knowledge and the ability to work in a team.

Thus, T.°Voloshinova developed the structure of self-educational competence of future information technology specialists, which is defined as the ability of an individual to carry out self-educational activities to deepen theoretical knowledge and improve practical skills to flexibly respond to rapid changes in the modern information society and the ability to independently solve the tasks of professional direction in the field of information technology to increase their level of competitiveness in the labour market. The author identifies the following components: motivational-value (development of motivation for constant self-improvement and self-development), organizational-technological (formation of the ability to determine the goal of self-education, plan, independently manage educational and cognitive activities), practical-activity (the ability to carry out self-educational activities to solve professional problems), reflexive-analytical (the ability to exercise self-control and reflection of one's self-educational activities) [T.°Voloshinova, 2018]. We are sure that the highlighted results of the work will be taken into account by us in the process of studying the essence and structure of the information and analytical competence of students.

The study by P. Melezhyk considers the process of forming the competence of partnership work. We share the author's position that the ability to work with a partner is an integral part of the workflow in modern IT companies. In addition, students more easily absorb educational material when they perform team tasks that interact with other students. The need to form this skill is perceived by many teachers, however, not all teachers use team tasks [P. Melezhyk, 2018]. Agreeing with P.°Melezhyk, we note that these difficulties are caused by the preparation of team tasks, difficulty in evaluating teamwork, etc.

In the context of professional training for future bachelors of computer science, we will also highlight regulatory sources as the most important reference points of our research work: "Digital Agenda of Ukraine – 2020", which reveals the main areas, initiatives, projects of "digitalization" of Ukraine, programs "UNESCO ICT competency framework for teachers", "European Framework for the Digital Competence of Educators", "Digital Competence Framework for Citizens (DigComp 2.0: Digital Competence Framework for Citizens)", etc.

It should be emphasized that our understanding of the development of digitalization of the educational process in Higher Education Institutions, and the development of digital competence is focused on the main provisions of the updated "Recommendations of the European Parliament and the Council for lifelong learning". In particular, the document states that digital competencies include confident, critical, and responsible use and interaction with digital technologies, work with information, and the use of ICT.

As evidenced by educational practice, it is this understanding of digital competencies that most scientists and methodologies use in the context of professional training of students. An important aspect of implementing digital technologies in life is understanding how they support communication, creativity and innovation, providing the opportunity to use, access, filter, evaluate, create, program and share digital content in the context of education informatization. Agreeing with the main provisions of these recommendations, we will also outline important op-

portunities for the use of digital technology for the implementation of an active human civic position, social integration, cooperation, creativity, etc.

If we talk about the theoretical and methodological foundations of informatization of education in Ukraine, today the relevant scientific knowledge is quite widely represented in the works of famous scientists, among them: V.°Bykov, N.°Morse, R.°Klopov, V.°Osadchy, L.°Panchenko, S.°Rakov, Yu. Tryus, S.°Semerikov, O.°Spivakovsky, V.°Velychko, M.°Zhaldak, and others.

The above studies cover topical issues of the essence of informatization of education, the content and structure of methodological systems of open education, information technologies in education, psychological, pedagogical, and valeological aspects of electronic educational resources and use of digital technology, preparing students for work in open educational systems, etc. The following blocks of scientific knowledge are also of particular interest: the application of methods and algorithms of computational intelligence and data mining in the tasks of classification, forecasting, and cluster analysis using software tools for supporting multidimensional data analysis based on DataMining, TextMining, WebMining technologies, mastering system programming languages and methods of program development, performing parallel and distributed calculations, applying numerical methods and algorithms for parallel structures, etc.

Analysis of the existing fund of modern scientific knowledge indicates the limited research on the formation of strategic competence of IT bachelors.

In our study, we consider it necessary to highlight the author's opinion on the leading definition – strategic competence. This will allow us to further clarify its structure and content, as well as reveal the main conditions for its formation.

The need for these actions is due to the importance of studying strategic competence in three main sections:

– elemental (a set of components, the interaction between which ensures the implementation of the relevant activity);

– functional (methodology for adopting strategies);

– procedural (technology of strategy development and implementation in the existing environment).

In the process of finding an answer to the formulated research problem, we turned to the ideas of scientists that strategic (otherwise – communicative-strategic, educational-strategic) competence is most often associated with theory and practice in the field of philology (yes, the need to compensate for the insufficient development of communication abilities and the importance of establishing contacts, etc.).

Modern scientists do not treat the definition of the leading definitions of our research in the same way, describing it through the ability (V.°Konova, O. Pysarevska, O.°Shapran), quality (T.°Gavrylenko, K. Pasynchuk), integrative phenomenon, neoplasms (T.°Tymofeeva), integrative unity of qualities (M.°Oliyar). At the same time, the main characteristics are distinguished: the ability to determine the purpose of the activity, predict and plan it, effectively choose ways to implement the goal and objectives, etc.

Thus, O. Pysarevska believes that strategic competence is an integrative phenomenon and consists of the ability of a person to adequately use the acquired repertoire of strategies based on acquired knowledge and skills [O. Pysarevska, 2019]. Moreover, we are talking about various strategies: communicative, educational, management, planning, goal setting, etc.

According to the authoritative position of O.°Antonova strategic competence is the skill and ability to implement and develop, acquire and assimilate, accumulate and rethink a set of special knowledge, skills and abilities for designing the future state to increase the efficiency of activities [O.°Antonova, 2018]. We agree with the author that strategic competence makes it possible to choose the leading direction of development under conditions of uncertainty. This allows the establishment of certain norms, restrictions, and standards as benchmarks for strategic decision-making.

Thus, as a result of our theoretical analysis of scientific approaches to the characteristics of strategic competencies, we note that the strategic competence of an IT specialist is a personal integrative education, which is a unity of professionally significant qualities, knowledge and skills, with the help of which specialists formulate the strategic and tactical purpose of work, show a value-motivational attitude to strategic changes and flexibility in behaviour, depending on the

factors of the external environment, make an adequate choice and implement strategies depending on the situation, while achieving the effectiveness of the professional activity.

It is also worth noting the peculiarity of the implementation of strategic activities, the key to which is the appropriate competence – in the context of traditional activities, planning occurs from the past through the present to the future. On the contrary, in tactically strategic activities, planning goes from the predicted imagined picture of the future to the present, taking into account randomness, the dependence of actions on the external environment, multifactorial nature, etc.

As evidenced by the above definitions, a high level of strategic competence of an IT specialist provides the following:

– determination of the leading purpose of professional activity;

– selection of an effective model of professional behaviour by the existing conditions;

– planning and development of measures to adapt to the conditions of professional activity;

– implementation of planned professional actions and operations (strategies);

– prompt response to problems arising in the process of professional activity;

– assessment of current and projected results of professional activity, etc.

The experience of organizing and implementing university training for future IT specialists shows that a high level of strategic competence makes it possible to choose and prepare the right hardware and software, rational methods for solving professional tasks, allows for the modernization of IT infrastructure, and optimization of IT efficiency for innovation. This makes it possible to manage the IT sector, in particular, in the context of IT infrastructure management, IT projects, and IT costs to increase the security and stability of the industry. It is important to define long-term goals, taking into account the phased process of optimizing existing IT systems.

Conclusions from this study and prospects for further exploration. Therefore, we have considered the main aspects of professional training of future IT specialists. The importance of strategic activities to the work of a modern IT specialist is highlighted. The importance of the formation of strategic competence in three main sections is substantiated: elemental (a set of components, the interaction between which ensures the implementation of the relevant activity); functional (methodology for adopting strategies); procedural (technology for developing and implementing a strategy in the existing environment).

The author presents the author's vision of the strategic competence of an IT specialist, which is a personal integrative education, which represents the unity of professionally significant qualities, knowledge and skills, with the help of which specialists formulate the strategic goal of the work, show a value-motivational attitude to strategic changes and flexibility in behaviour depending on the factors of the external environment, make an adequate choice and implement strategies depending on the situation, while achieving the effectiveness of the professional activity.

Prospective areas of research include the study of the real state of formation of strategic competence of future bachelors in the field of IT.

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STRATEGIC COMPETENCE AS A GUARANTEE OF PROFESSIONAL ACTIVITY OF A MODERN IT SPECIALIST

Volkova Nataliia, Doctor of Pedagogical Sciences, Professor, Head of the Department of Innovative Technologies in Pedagogy, Psychology and Social Work, Alfred Nobel University, Dnipro

E-mail: npvolkova@yahoo.com

ORCID ID: 0000-0003-1258-7251

Oliinyk Iryna, PhD in Pedagogy, Associate Professor at the Department of Innovative Technologies in Pedagogy, Psychology and Social Work, Alfred Nobel University, Dnipro

E-mail: iv_oliynik@ukr.net

ORCID ID: 0000-0002-1749-1518

Karpova Maryna, PhD in Pedagogy, Senior Lecturer at the Department of Innovative Technologies in Pedagogy, Psychology and Social Work, Alfred Nobel University, Dnipro

E-mail: karpovam675@gmail.com

ORCID ID: 0000-0002-7691-0379

The article examines the current problem of professional training of future IT specialists in the context of forming their strategic competence because it is critical for university graduates in the field of IT to be able to strategically plan actions in different ways for effective implementation in their professional activities. Therefore, the strategy of professional activity is carried out by means of separate tactical actions, which collectively make up strategic activity. Thus, s IT specialists' shaping strategic competence allows understanding of which actions are the most important for the realization of the goal and the achievement of professional tasks.

It has been established that strategic competence of an IT specialist is a personal integrative creation. This represents the unity of professionally significant qualities, knowledge and skills, with the help of which specialists formulate the strategic goal of work, show a value-motivational attitude to strategic changes and flexibility in behaviour depending on the factors of the external environment, make a reasonable choice and implement strategies depending on the situation, while achieving the effectiveness of the professional activity. The importance of shaping strategic competence in three main sections is substantiated including: elemental (a set of components, the interaction between which ensures the implementation of the relevant activity); functional (methodology for adopting strategies); and procedural (technology for developing and implementing a strategy in the existing environment).

It has been proved that a high level of IT specialists' strategic competence ensures the following: determination of the leading goal of professional activity, choosing an effective model of professional behaviour following existing conditions, planning and development of measures for adaptation to conditions of professional activity, implementation of planned professional actions and operations (strategies), etc.

The article also presents the main aspects of professional training of future IT specialists. The experience of organizing and implementing university training for future IT specialists shows that a high level of strategic competence makes it possible to choose and prepare the right hardware and software, rational methods for solving professional tasks, allows for the modernization of IT infrastructure, optimization of IT efficiency for innovation. This makes it possible to manage the IT sector, in particular, in the context of IT infrastructure management, IT projects, IT costs, to increase the security and stability of the industry. It is important to define long-term goals, taking into account the phased process of optimizing existing IT systems.

A strong emphasis is also placed on the following blocks of scientific knowledge: the use of technologies and algorithms of computational intelligence and intelligent data analysis in the tasks of forecasting, analytics, cluster analysis using software tools to support multidimensional data analysis based on Data-Mining, TextMining, WebMining technologies, mastering system programming languages and methods of developing online programs, performing parallel and distributed calculations, applying numerical methods and algorithms, etc.

The article also provides promising directions for research as a study of the real state of shaping strategic competence of future bachelors in the IT field.

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