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APPROACHES TO DEVELOPING STUDENTS' INFORMATION CULTURE IN ENGINEERING EDUCATION

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The article focuses on the importance of information culture as an integral part of professional culture of engineers, which affects the quality and safety of engineering solutions. The main two approaches to the definition of "information culture" are determined, which include an information approach when the information culture is reduced to the concept of computer or information literacy and a culturological approach when the concept "information culture" is seen as a way of human life in the information society. Development of the information culture acts as a process of harmonization of the inner world of man in the acquisition of socially significant information.

The main components of information culture of engineers are highlighted, including literacy and competence in understanding the nature of information processes and relationships, humanistically oriented information value-semantic sphere, developed information reflection, creativity in information behaviour and socio-information activity.

Based on a broad understanding of information culture as a qualitative characteristic of the life of a specialist in terms of receiving, transmitting, storing and using information, where universal moral values are the main priority, basic methodological approaches to forming information culture of future engineers are proposed, namely: system, personal, activity, integrative, culturological, axiological and reflexive approaches. The process of developing future engineers' information culture in the process of professional training in higher educational institutions will be effective providing that it is based on the substantiated methodological approaches.

Key words: *Information, information culture, professional training, future engineer, methodological approaches.*

Problem Statement. Current social developmental trends, such as globalization and informatization, have shaped essential characteristics of today's

life of society. Nowadays knowledge and information play a decisive role in the intellectual development of humanity. The concept "information" has acquired an independent philosophical status, and it performs important ideological and methodological functions.

The expansion of engineering activity with the historical development of society is a natural process, which consists in its spreading, rooting in new, previously distant from it forms of human activity. The process of development of information technology has significantly changed engineering, which is becoming increasingly important in modern society.

At the same time, the cost of engineering decisions, their social and environmental consequences is becoming higher, which puts new demands on the professional and personal qualities of the engineer. This brings about the issue of goals and ideals, and, consequently, reasons and values, which lie behind them. Engineers must not only meet the consumer requirements of the near future, but also take into account the long-term prospects of society development.

Informatization of society objectively raises the issue of information culture of the individual. The quality and safety of engineering solutions and products depend on the level of information culture of the engineer, which is an integral part of professional culture. In the conditions of free access to numerous information resources, continuous information exchange between members of society, the process of developing future engineers' information culture should take place during professional training in higher educational institutions.

Literature review. Information culture has been a topical issue for the last three decades since people started using the Internet in their everyday lives, and it is investigated in various aspects. The majority of scientists research information culture of organizations. Chun Wei Choo (2013) studies organizational culture and investigates connection between types of information culture (result-oriented, rule-following, relationship-based and risk-taking) and organizational effectiveness. B. Travica (2005) explores the concepts of information politics and information culture in an organization and finds that information politics and information culture of an organization might depend on its development phases. A. Sundqvist and P. Svärd (2016) study the academic discourse on information culture, which is investigated in various aspects: in terms of organizational performance, system implementation, types of manifestation of information culture, and records management. D. Fricker (2015) investigates organization's information culture, and some strategies that can influence staff's values and behaviours, proposing an 'Information Culture Framework', which includes three levels of factors according to their manageability. M. Kyrychenko (2017) considers information culture as a component of the ideology of the contemporary information society.

Identifying unsolved aspects of the problem. Nowadays there is a large amount of research on personal information culture. L. Haddon (2005) discusses social implications of information and communication technologies depending on the way people develop their personal information culture. N. Samokhina (2016) considers tendencies of society development and claims that personal information culture is essential for a person to counteract to extremism and terrorism ideas on the Internet. Problems of information culture development in vocational education were studied by V. Ashanin, N. Khodyakova, M. Kolyada, L. Ovchinnikova, T. Polyakova, L. Zelenova and others. However, the issues of developing information culture of future engineers during their professional training are insufficiently covered in scientific publications. **The purpose of the article** is to identify and substantiate methodological approaches to the development of information culture of future engineers in the process of professional training in higher technical educational institutions.

Main findings. In the modern scientific literature there are two main approaches to the definition of "information culture": information and culturological approaches. In the first approach, researchers consider the information culture as a set of knowledge about how to search, store, process and transmit information, the ability to purposefully work with information and use information and communication technologies for its receiving, processing, storage and transmission, which form the basis of information activities aimed at meeting information needs. In this aspect, information culture is reduced to the concept of computer or information literacy. In the second approach, the concept "information culture" has a broader meaning and is seen as a way of human life in the information society. Development of information culture acts as a process of harmonization of the inner world of man in the acquisition of socially significant information.

Information culture is a complex multifaceted concept, which, in our opinion, requires consideration of social, personal and axiological components. We share the point of view of I. Khanheldieva (1993), who believes that information culture is a qualitative characteristic of human life in the field of receiving, transmitting, storing and using information, where the priority is universal moral values.

Information culture includes: literacy and competence in understanding the nature of information processes and relationships; humanistically oriented information value-semantic sphere (aspirations, interests, worldview, value orientations); developed information reflection, as well as creativity in information behaviour and socio-information activity. Humanization of society involves developing humanistically oriented information culture, which includes nurturing the following values: priority of goal setting over expediency;

awareness of the harm of dogmatic and conformist decisions; developing of future professionals' need to carry out their professional activities in the interests of humanity.

In our opinion, the main methodological principles of developing personal information culture of future engineers should be systemic, personal, activity, integrative, culturological, axiological and reflective approaches.

The system approach in pedagogy is defined as a method used to analyze objects that have a number of interconnected elements, combined with common functions and purpose, the unity of management and operation. A system is a set of interconnected elements that form a certain integrity and interact with each other. Moreover, the interaction of the components of the system acquires mutual interaction of components that are aimed at a final outcome. The system actively influences its components and transforms them according to its own nature. Changes in one component inevitably cause changes in others and in the system as a whole.

According to the system approach, the process of developing the information culture of future engineers is considered as a holistic system of multilevel components in the diversity of their connections and relationships, and requires consideration of significant links between all elements of the pedagogical system.

It is possible to influence the process of developing personal information culture in a higher technical educational institution only when teachers focus on each person with their own individual qualities and abilities. This requires reliance on a student-centred approach as the most important principle in the pedagogical process. It provides a focus on the individual as the main value, purpose, subject, result and the main criterion for the effectiveness of the pedagogical process. The student-centred approach requires the recognition of the uniqueness of the individual, their moral and intellectual freedom, the right to respect, which requires reliance on the natural process of student's creative self-development.

According to V. Andrushchenko (1996), the main vocation of higher education of the 21st century is to ensure the spiritual development of man to understand the meaning and essence of his life, which involves expanding and deepening the possibilities of self-actualization of the personality. A similar opinion is expressed by S. Podmazin (2006), arguing that the purpose of person-centred education is not the personality formation or education, but discovering, supporting person's abilities and uniqueness, development of self-actualization mechanisms, self-development, self-education and other mechanisms necessary for formation of a unique personal image.

The activity approach in pedagogy involves learner's activities as the basis, means and condition of personal development. As activity means transformation of the human environment, it is a creative process. Transforming the surrounding environment, individuals transform themselves, developing and self-realizing. A prerequisite for developing the personal information culture is students' participating in various activities based on their own strengths, the internal logic of their development, resulting in the formation of a personality capable of choosing, evaluating, planning and performing various activities. In the process of performing activities, interaction with the surrounding world the process of internalization takes place, which means transition of external activities into the internal processes.

Since the personal information culture is a complex personal and social formation, the process of its development in higher educational institutions should be based on the integrative approach, which involves understanding the education system as a set that organically includes procedural and effective components, thus enabling to manage them. Intrapersonal integration is based on the ideas of the integrative nature and integrity of man. According to B. Ananiev (1996), intrapersonal integration is possible and necessary due to the diverse, multifaceted and contradictory dynamic existence of human qualities and features of open and closed systems, when his consciousness is both a subjective reflection of objective reality and the inner world of the individual. Values, life plans and prospects, personal experiences, evaluations and self-assessments are formed in the inner world, which are objectified in human practice. The result of the internal integration is integration of professional knowledge. This result is achieved through a combination of internal efforts of the student's personality and external influence of purposeful educational process, which is associated with the student's awareness of responsibility for the result of their education and the individual's readiness for self-education and self-development.

The essence of future engineers' information culture is largely determined by such a fundamental concept as "culture", so the culturological approach should ensure the development of the information culture in accordance with the laws of universal culture. The culturological approach is a set of methodological techniques that provide analysis of any sphere of social, professional and personal life through the prism of system-forming culturological concepts. In the logic of this approach, various aspects of the essence of man as a subject of culture (consciousness, self-consciousness, spirituality, morality, creativity) are considered as facets of a holistic cultural person. The culturological approach allows interpreting the assimilation of human culture as a process of personal discovery, creation of the world of personal culture, participation in the dialogue

of cultures, where personal actualization of the meanings embedded in it takes place.

The axiological approach is connected with the culturological approach, which is organically inherent in humanistic pedagogy, as the personality is the highest value of society and the goal of social development. The axiological approach is defined as the system-value approach, which is based on traditional and new value systems of education. Higher engineering education traditionally emphasizes the external, informative function as a dominant. But lack of attention to the formation of spiritual and moral values might have unpredictable catastrophic consequences for humanity, as engineering decisions affect almost all spheres of society functioning, and must be made by experts with consideration of short-term prospects and long-term consequences for man, society and the planet. It is essential to understand that the world of values is objective; the values of life become part of the content of education. Thus, the axiological approach becomes an integrated and necessary component of understanding sustainable social development, the problems of interaction of cognition and value consciousness, and also acts as a new educational paradigm.

Despite the difficulties of the current stage of modernization of higher education, a key element of vocational education should remain the systematic development of students' professional consciousness and self-awareness. Pedagogical influence should be aimed primarily at the formation of generalized strategies for solving professional problems and at the same time provide future specialists with the skill to summarize their own practice, to clarify the need and sequence of actions to change their own personality. Therefore, emphasis in the development of the student's personality and his professional position must be placed on the processes of self-development, self-design, self-regulation. The specification of educational tasks in this case may relate to the formation of professional thinking of future professionals in the context of its enriching with reflective content. According to the reflective approach, the student as an active subject of the educational process is included in assessing the quality of education in order to form their theoretical and practical readiness for professional, intellectual, creative and self-educational activities.

Cumulative implementation of the considered approaches is the methodological basis for the development of the personal information culture of future engineers in the educational process.

Conclusion and recommendations for future research. Summing up, we note that the personal information culture is a multifaceted, integral, dynamic feature of the individual, which characterizes the professional value of the future specialist. It is an ideal model of how to realize personal manifestations in connection with the implementation of information activities. Mastering the

information culture by a future engineer will create a solid foundation for structuring his knowledge, will provide tools and methods for developing the ability to navigate in a rapidly changing world, enable them to successfully and confidently master new industries, develop the ability to broadly view their professional activities and their consequences for humanity. The process of forming the information culture in the process of professional training should take into account the above mentioned methodological approaches, which will ensure its effectiveness. The prospective areas for further research include principles of developing future engineers' personal information culture and mechanisms of their realization in pedagogical process of higher educational institution.

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ПІДХОДИ ДО ФОРМУВАННЯ ІНФОРМАЦІЙНОЇ КУЛЬТУРИ СТУДЕНТІВ В ІНЖЕНЕРНІЙ ОСВІТІ

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У статті зосереджено увагу на важливості інформаційної культури як невід'ємної частини професійної культури інженерів, що впливає на якість та безпеку інженерних рішень. Визначено основні два підходи до визначення поняття «інформаційна культура», які включають інформаційний підхід, коли інформаційна культура зводиться до поняття комп'ютерної чи інформаційної грамотності та культурологічний підхід, коли поняття «інформаційна культура» розглядається як спосіб людського життя в інформаційному суспільстві. Розвиток інформаційної культури виступає як процес гармонізації внутрішнього світу людини в процесі отримання соціально значущої інформації.

Виділено основні компоненти інформаційної культури інженерів, зокрема: грамотність та компетентність у розумінні суті інформаційних процесів та взаємозв'язків, гуманістично орієнтована інформаційно-ціннісно-семантична сфера, розвинена інформаційна рефлексія, креативність в інформаційній поведінці та соціально-інформаційній діяльності.

Спираючись на широке розуміння інформаційної культури як якісної характеристики життя фахівця з точки зору отримання, передачі, зберігання та використання інформації, де загальнолюдські моральні цінності є головним пріоритетом, запропоновані основні методологічні підходи до формування інформаційної культури майбутніх інженерів, а саме: системний, особистісний,

діяльнісний, інтегративний, культурологічний, аксіологічний та рефлексивний підходи. Процес формування інформаційної культури майбутніх інженерів у процесі професійної підготовки у вищих навчальних закладах буде ефективним за умови, що він базується на обґрунтованих методологічних підходах.

Ключові слова: *інформація, інформаційна культура, професійна підготовка, майбутній інженер, методологічні підходи.*

ПОДХОДЫ К ФОРМИРОВАНИЮ ИНФОРМАЦИОННОЙ КУЛЬТУРЫ СТУДЕНТОВ В ИНЖЕНЕРНОМ ОБРАЗОВАНИИ

М. Н. Кабанец, В. Н. Алфимов

В статье раскрыта важность информационной культуры как неотъемлемой части профессиональной культуры инженеров, которая влияет на качество и безопасность инженерных решений. Определены два основных подхода к определению информационной культуры, которые включают информационный подход, когда информационная культура сводится к понятию компьютерной или информационной грамотности, и культурологический подход, когда понятие «информационная культура» рассматривается как способ человеческой жизни в информационном обществе. Развитие информационной культуры выступает как процесс гармонизации внутреннего мира человека в процессе получения социально значимой информации.

Выделены основные компоненты информационной культуры инженеров, в частности: грамотность и компетентность в понимании сути информационных процессов и взаимосвязей, гуманистически ориентированная информационно-ценностно-семантическая сфера, развитая информационная рефлексия, креативность в информационном поведении и социально-информационной деятельности.

Опираясь на широкое понимание информационной культуры как качественной характеристики жизни специалиста с точки зрения получения, передачи, хранения и использования информации, где общечеловеческие нравственные ценности являются главным приоритетом, предложены основные методологические подходы к формированию информационной культуры будущих инженеров, а именно: системный, личностный, деятельностный, интегративный, культурологический, аксиологический и рефлексивный подходы. Процесс формирования информационной культуры будущих инженеров в процессе профессиональной подготовки в высших учебных заведениях будет эффективным при условии, что он базируется на обоснованных методологических подходах.

Ключевые слова: *информация, информационная культура, профессиональная подготовка, будущий инженер, методологические подходы.*

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