Theoretical model of development of information competence among students enrolled in elective courses

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ABSTRACT

The current study focuses on the research topic of creating a theoretical model of development of information competence among students enrolled in elective courses. In order to examine specific features of the theoretical model of development of information competence among students enrolled in elective courses, we performed an analysis of formation of the concept "information competence of students". We investigated and provided theoretical substantiation for meaningful characteristics of information competence of students. We developed and validated the theoretical model of development of information competence among students enrolled in elective courses, including criteria, parameters and efficiency levels of this process. We recommend to implement the theoretical model of development of information competence among students enrolled in elective courses for development of higher educational programs.

1.   Introduction

Information competence is an essential component of educational development at the current stage of social progress. The emerging role of information in the social life manifests itself in two ways – increasing volume of information and transformation of information into the most important resource for development of the society. Both processes equally influence the model of educational system; therefore, they should be taken into consideration in the course of its modernization, which leads to emergence of a topical issue of promoting information competence among all members of the society.

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One of the trends in modernization of education is prioritizing the competence approach. The competence phenomenon is discussed in the following studies: Albekova *et al.* (2014), Asenova *et al.* (2013), Berkimbaev *et al.* (2013), Gifford (1994), Brown-Rice, & Furr (2013), Fernandez *et al.* (2012), Hutchinson (1994), Sundburg (2001), White (1959), and others. These researchers consider the competence approach to be an approach focused on the results of education that are interpreted as an ability of a person to act in various problematic situations, rather than as total amount of acquired knowledge. Moreover, the results of education are admitted to be valuable beyond the educational system; therefore, such approach allows to adjust education to the demands of labor market, to satisfy the need of employers for training of informationally competent specialists.

According to the studies of Berkimbaev *et al.* (2012), Chown (1994), Kramsch (2006), Day (1994), Johnson *et al.* (2012), Kerimbaeva (2012), Niyazova *et al.* (2013), Oreck (2004), Otepova, & Ilyassova (2014), Sakenov *et al.* (2012), the major characteristics of the competence approach include:

– broad practical orientation with an emphasis on training for the activity, including both professional skills and techniques and more widely applicable ones, such as social personal skills, developed in the context of professional training;

– systemic and integrative approach, focused on systemic development of the expected results of training over the whole educational program and individual courses, their integrity, aimed at the major goal – development of a competent person;

– comprehensiveness, i.e., development of the expected results of training together with the achievement criteria, control techniques, and essential conditions for enabling the students to accomplish the expected training results;

– consistency with an emphasis on regular monitoring and adjustment of the training results, processes and means for achieving these results in order to improve the educational program;

– thorough consideration of values and demands of students, state, and society;

– disclosure with an emphasis on transparence and clarity of goals of the educational program, involvement of the parties in development and adjustment of the program goals, consistency of goals with national and international guidelines.

The competence approach implies the assessment of a student's ability to apply the acquired knowledge to practical tasks. It should be noted that students should be able to process various types of information, using computers and other technical means, to organize their own information activity, to be able to implement new information and communication technologies, etc. We should work toward enabling our young people to both obtain and create new knowledge. These days the most precious knowledge is creative thinking, ability to process knowledge, to produce new solutions, information technologies and innovations. Therefore, the most important task is to develop such qualities of students as proper perception and rapid reaction to new factors, self-sufficiency and promptness in making decisions, willingness to conduct egalitarian communication, ability to quickly adapt to the information society. The major elements of information competence of undergraduate students include informational scope, theoretical knowledge in information technologies, system of knowledge, skills and techniques, concerning search for information, its analysis and implication, practical skills of using contemporary information technologies. Considering the specified elements, we believe that information

competence of undergraduate students is the most important component of general professional competence among students, being an integrated, dynamic evolution of personality, marked by rational style in information activities, related to mastering new information technologies, and capable of creative performance within the educational system. The other side of the research topic of development of information competence among undergraduate students is its connection with the elective courses. Elective courses are the courses that students are free to choose in order to satisfy their professional interest. In spite of a comprehensive range of studies (Asenova *et al.*, 2013; Kul'kov, 2013; Murzalinova, & Koleva, 2012; Henner, 2004; Utegenov *et al.*, 2014), which are, undoubtedly, of great theoretical and practical value, one should note that development of information competence in higher educational institutions is an issue, still open for theoretical conceptualization and experimental studies. The list of unsolved questions includes the issues of pedagogic components of information competence among students, specific features of its development over participation in the elective courses; the issues of creating an effective theoretical model of development of information competence among students enrolled in elective courses also remain topical and need to be elaborated.

The comprehensive analysis of the current state of educative practice allows to reveal the major discrepancy between the emergence of shared information space due to expanding implementation of new information technologies in professional activities, and underexplored issue of development of information competence among students enrolled in elective courses within the system of higher professional education.

Thus, the analysis of the studies by Albekova *et al.* (2014), Asenova *et al.* (2013), Henner (2004), and comprehension of higher education practices allowed us to update the major controversy between the objective need for the development of information competence among students enrolled in elective courses and insufficient degree of scientific development of theoretical basis for development of information competence among students enrolled in elective courses within the system of higher professional education and the relevant model of development of information competence among students enrolled in elective courses.

The problem range of the study was integrated into the research topic, which can be defined as following: what is the content of the theoretical model of development of information competence among students enrolled in elective courses?

The current study was aimed at solving the problem of development of information competence among students enrolled in elective courses.

2. Methods

The methodological basis of the study included:
– a set of systemic, competence, learner- and activity-centered, informational methodological approaches;
– theoretical approaches to creation and development of educational systems and occurring innovative processes;
– methodical approaches to studying professionalism and modelling professional activities.

The theoretical basis of the study generally includes concepts, ideas, conceptions and theories. Philosophical, psychological and pedagogical ideas and conceptions of human essence and nature, social, cultural and historical causation

of personality development and its major part in the activity process, general scientific concepts of the central part of education in the social system, conceptions of informatization of society and education comprise fundamental background for our research.

Study methods: in order to solve the defined task of creating a theoretical model of development of information competence among students enrolled in elective courses, we implemented theoretical methods of research, such as studying and analyzing philosophical, informational, pedagogical and psychological literature on the research topic; contrastive and comparative analysis, modelling, scientific forecasting and design; synthesis, comparison, generalization, analysis.

3.   Results

Information competence of students as an integrated, dynamic evolution of personality, marked by rational style in information activities, related to mastering new information technologies, and capable of creative performance within the educational system, is closely related to obtaining, processing and transmitting information, turning it into knowledge, using information resources and technologies, activities within the information society.

The issues of development of information competence of students as a personal quality, of shaping the competence of a specialist. The studies of Utegenov *et al.* (2014), Henner (2004), Onalbek *et al.* (2013) and others particularly distinguish information competence of students as a key feature, ensuring almost every type of activities and necessary for professional self-fulfillment of a person. Certain authors define information competence of students as a goal of professional training and an essential component of professional competence (Murzalinova, & Koleva, 2012; Kerimbaeva, 2012; Dobrova, 2009 and others).

We believe that information competence of students comprise a basis for conscious choice, formation of opinion, making decisions, and taking informed and responsible actions:

   – to reveal and define the unknown;
   – to identify and organize information, to provide access to information resources (including search for information and knowledge in cyberspace, in global educational network);
   – to assess quality and relevance of certain information, as well as reliability and authenticity of information resources;
   – to organize knowledge and information.

Among the researchers in the field of theory and practice of information technology training, the following papers are focused on the issues of development of information competence among students: Murzalinova, & Koleva (2012), Kerimbaeva (2012), Henner (2004) and others. These studies include developing of information competence of students mostly with computer technologies; therefore, information competence of the students is assessed from the perspective of the level of the person's capability to master information technologies.

In the present state of the art of pedagogics many researchers (Berkimbaev *et al.*, 2013; Dobrova, 2009 and others) have controversial definitions of the "information competence of students" concept.

The results of the analysis allowed us to define the attributive features of information competence of students that make it a unique, peculiar, substantive phenomenon:

– skills of unassisted search, analysis and selection of necessary information, ability to organize, transform, preserve and transmit it with real objects and information technologies;

– new literacy, including the skills of active unassisted processing of information by the person, of making fundamentally new decisions in unforeseen situations, using technological means;

– personal ability to search, select, analyze, organize, present and transmit information with no external assistance;

– integrative personal quality – complex formation of knowledge, skills, and abilities of the subject concerning information, information and communication technologies, together with the experience in using them, as well as ability to improve their own knowledge and skills, to make new decisions under changing conditions or in unforeseen situations, using new technological means;

– personal mental state, integrating theoretical knowledge on sources of information and ability to work with information, presented in different forms, and the ability to implement new information technology with no assistance;

– complex personal and psychological formation, based on integration of theoretical knowledge, practical skills, related to innovative technologies, and a certain set of personal qualities;

– professionally valuable quality of mastering the basic skills of working with information;

– set of personal qualities of the subject, enabling them to achieve strong performance in their activities under conditions of rapidly changing informational infrastructure of the company together with global trends in informational behavior of people;

Broadening volume and essence of the concept of information competence of students: from domain trends to ability, from personal quality to personal state, formation within the personality structure; from domain to professional activities – reflects dynamic response of conceptual framework of pedagogics to more and more complex demands of information society.

The controversy lies in the fact that the existing principles of development of information competence among students responds less rapidly to promptly altering conditions of information society, thus narrowing the educational yield to skills of working with information. For instance, key required information competence of students, which defines the target competence, implies the ability to feel familiar with information and knowledge, to search, analyze, select, transform, preserve, interpret and transmit it without external assistance, using real technical objects and information technologies.

Therefore, we will define information competence of students as an integrative personal quality, reflecting the process of selection, assimilation, processing, transformation and generation of information into a specific type of domain-specific knowledge, which promotes formation of experience of information and communication activities; comprehensive actualization of this experience during the learning process motivates readiness and ability of students to transform information into knowledge, with potential self-education, self-improvement and self-fulfillment of the person in modern information society. The sequence of operations with information can be traced in this definition, allowing

us to structure the process of development of the examined competence of students in the course of modelling. Such understanding of information competence of students provides scientific basis for development of programs of elective courses. The main component of development of content of elective courses as a tool of formation of information competence among students is providing experience of informational activity among undergraduate students.

3.1. Originality results.

Our study includes theoretical substantiation, design and presentation of the Theoretical model of development of information competence among students enrolled in elective courses. Any pedagogical process should be based on comprehensive approach, reproducibility and efficiency of which completely depend on consistency and quality of organization of this process. Due to these considerations, we used comprehensive approach as a foundation for the Theoretical model of development of information competence among students enrolled in elective courses (see Figure 1).
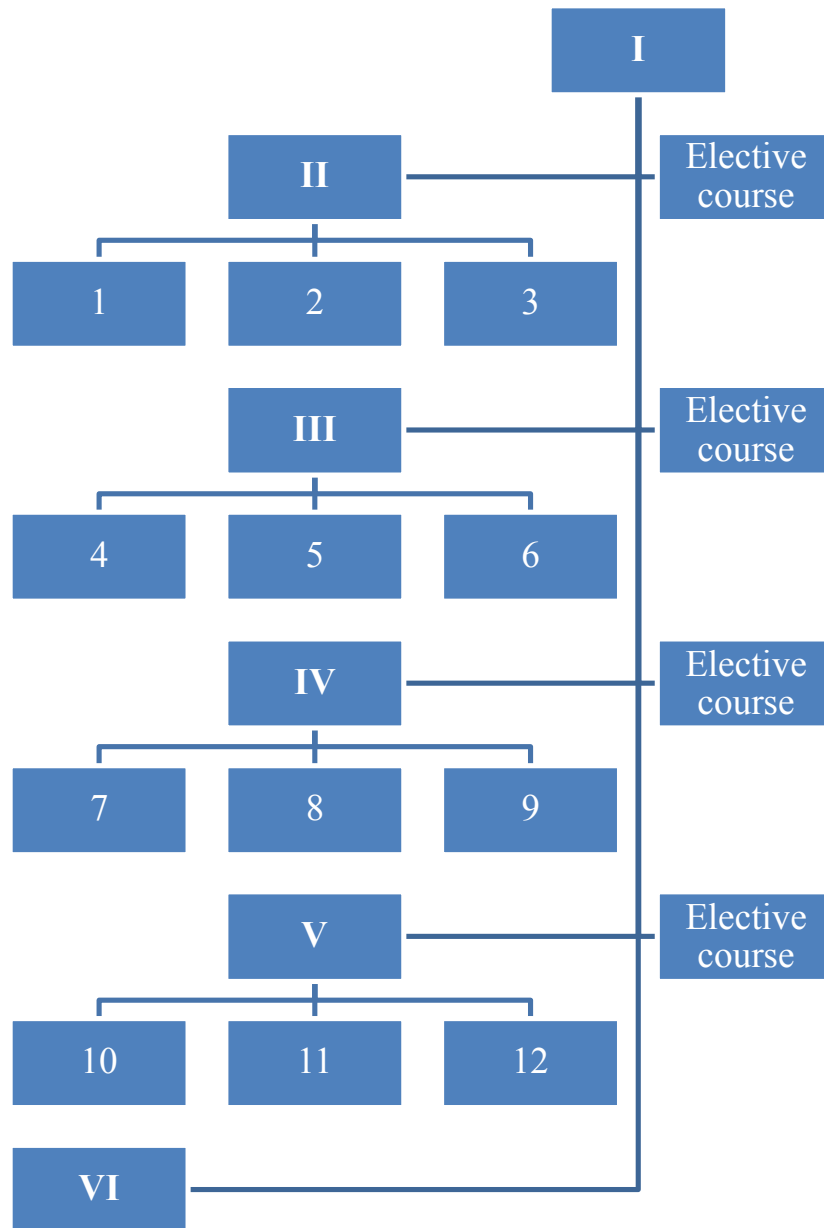
Figure 1. Theoretical model of development of information competence among students enrolled in elective courses

Comment on Figure 1. Theoretical model of development of information competence among students enrolled in elective courses. Current Theoretical model of development of information competence among students enrolled in elective courses represents interaction between major elements of the process of development of information competence among students enrolled in elective courses:

I– process of development of information competence among students enrolled in elective courses

II–Destination block of development of information competence among students enrolled in elective courses:

1. Social mandate of the society and employers – a specialist with high level of information competence.

2. Goal – development of information competence among undergraduate students.

3. Tasks:
- to provide pedagogical conditions for obtaining information competence;
- to determine the set of methods, means and forms of education, promoting development of information competence among students.

III – Functional block of development of information competence among students enrolled in elective courses:

4. Functions:
- development;
- organization;
- motivation;
- management.

5. Approach to the organization of the model:
- systemic.

6. Principles:
- consistency.

IV – Evaluation block of development of information competence among students enrolled in elective courses:

7. Criteria: knowledge, proficiency, skills, self-rating, self-control.

8. Levels: high, average, low.

9. Conditions: organization of informational learning activity of students within the higher educational institution.

V – Organization block of development of information competence among students enrolled in elective courses:

10. Forms of teaching: frontal, group, individual.

11. Teaching methods: lectures with implementation of information technologies, brainstorming, roundtable discussion, work with digital textbooks, case analysis, trainings, game-based project development.

12. Training resources: personal computer, digital textbooks, information resources on the Internet.

VI – Result of development of information competence of students enrolled in elective courses: built-up information competence of students.

Elective courses (Informatics, Information Technologies, Methodology of Informatization of Educational Process, Information Systems) – optional disciplines with the program allowing to satisfy informational needs according with the subject of the discipline and personal professional demands of the students.

4.   Discussion

Information competence of students is an integrative personal quality, reflecting the process of selection, assimilation, processing, transformation and generation of information in the course of studying elective disciplines into a specific type of domain-specific knowledge, which promotes formation of experience of information and communication activities. Information competence of students is

comprehensive actualization of information experience during the learning process, motivating readiness and ability of students to transform information into knowledge, with potential self-education, self-improvement and self-fulfillment of the person in modern information society. The sequence of operations with information can be traced in this direction, allowing us to structure the process of development of the examined competence of students in the course of modelling. Such understanding of information competence of students provides scientific basis for development of programs of elective courses. The main component of development of content of elective courses as a tool of formation of information competence among students is providing experience of informational activity among undergraduate students. We use this approach as a foundation for the structure of the Theoretical model of development of information competence among students enrolled in elective courses. Theoretical model of development of information competence among students enrolled in elective courses includes the following blocks: destination, conceptual, functional, evaluation, and organizational blocks. The Theoretical model of development of information competence among students enrolled in elective courses allows extensive implementation of level-based approach to mastering the system of information competence in the course of studying elective disciplines; promotes organization of information activities in the course of studying elective disciplines; provides organization of information learning activities in the course of studying elective disciplines through realization of self-control.

5. Conclusion

Distinction and scientific novelty of our study lies in determination and specification of comprehensive approach to the process of development of information competence among students enrolled in elective courses. Systemic approach allowed us to develop and validate the structure, blocks and essence of the Theoretical model of development of information competence among students enrolled in elective courses. We methodologically defined and theoretically substantiated the conditions of organization of information learning activities of students in higher educational institutions that will promote effective implementation of the Theoretical model of development of information competence among students enrolled in elective courses. In the course of research, we elaborated the concept of "information competence", defining it as an integrative personal quality, reflecting the process of selection, assimilation, processing, transformation and generation of information in the course of studying elective disciplines into a specific type of domain-specific knowledge, which promotes formation of experience of information and communication activities. The established Theoretical model of development of information competence among students enrolled in elective courses contributes to further evolution of theoretical pedagogics in the system of higher education and methodology of professional training of undergraduate students, provides basis for prospective studies on the research topic of development of information competence of undergraduate students. In contrast with the studies by Dobrova (2009), Zhaparova *et al.* (2013), Kul'kov (2013), Gifford (1994), Berkimbaev *et al.* (2013), Rakhimbekova *et al.* (2015), Murzalinova, & Koleva, (2012), Kerimbaeva, (2012), Kramsch (2006), Henner (2004), our research provides an established Theoretical model of development of information competence among students

enrolled in elective courses, the structure of which implies proper conditions for renovation of methodological materials and guidelines, educational programs, courses of lectures, practical classes, laboratory courses, ensuring effective process of development of information competence among students enrolled in elective courses. We recommend to implement the established Theoretical model of development of information competence among students enrolled in elective courses for practical use in higher educational institutions.

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