

DEVELOPING THE FUTURE BACHELORS' INFORMATION NEEDS IN THE UNIVERSITY'S INFORMATION AND EDUCATION ENVIRONMENT

DESENVOLVENDO AS NECESSIDADES DE INFORMAÇÃO DOS FUTUROS BACHARÉIS NO AMBIENTE DE INFORMAÇÃO E EDUCAÇÃO DA UNIVERSIDADE

DESARROLLAR LAS NECESIDADES DE INFORMACIÓN DE LOS FUTUROS BACHILLERS EN EL ENTORNO DE INFORMACIÓN Y EDUCACIÓN DE LA UNIVERSIDAD

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ABSTRACT: This article aims to identify the effectiveness of a set of pedagogical conditions for the development of information needs of future bachelors in the information and educational environment. The main theoretical methods used are analysis, synthesis, comparison, and generalization. The central method is the experiment, in which 104 bachelors of the 2nd year took part. The article clarifies the concept of "needs", and their features in order to identify the conditions. The authors elaborate on the concept of "information needs of future bachelors" given the existing different definitions in pedagogy; define the properties of these needs; substantiate the possibility and necessity to develop future bachelors' information needs in learning and information activities on the basis of the university's information and education environment under the modern higher education informatization.

KEYWORDS: Future bachelors. Information needs. Learning and information skills. Educational environment. Pedagogical development conditions.

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RESUMO: Este artigo tem como objetivo identificar a eficácia de um conjunto de condições pedagógicas para o desenvolvimento das necessidades de informação de futuros bacharéis no ambiente universitário. Os principais métodos teóricos utilizados são análise, síntese, comparação e generalização. O método central é o experimental, no qual participaram 104 bacharéis do 2º ano. O artigo esclarece o conceito de "necessidades" e suas características para identificar as condições postas. Os autores elaboram o conceito de "necessidades de informação dos futuros bacharéis" dadas as diferentes definições existentes em pedagogia; definir as propriedades dessas necessidades; fundamentar a possibilidade e necessidade de desenvolver as necessidades de informação dos bacharéis em atividades de aprendizagem e informação com base no ambiente de informação e educação da universidade sob a informatização do ensino superior moderno.

PALAVRAS-CHAVE: Futuros bacharéis. Necessidades de informação. Competências de aprendizagem e informação. Ambiente educativo. Condições de desenvolvimento pedagógico.

RESUMEN: Este artículo tiene como objetivo identificar la eficacia de un conjunto de condiciones pedagógicas para el desarrollo de las necesidades de información de los futuros licenciados en el entorno de la información y la educación. Los principales métodos teóricos utilizados son el análisis, la síntesis, la comparación y la generalización. El método central es el método de experimentación, en el que participaron 104 licenciados de segundo año. El artículo aclara el concepto de "necesidades", y sus características a fin de identificar las condiciones. Los autores profundizan en el concepto de "necesidades de información de los futuros licenciados" dadas las diferentes definiciones existentes en pedagogía; definir las propiedades de estas necesidades; fundamentar la posibilidad y la necesidad de desarrollar las necesidades de información de los futuros licenciados en actividades de aprendizaje e información sobre la base del entorno de información y educación de la universidad en el marco de la informatización de la educación superior moderna.

PALABRAS CLAVE: Futuros bachilleres. Necesidades de información. Habilidades de aprendizaje e información. Ambiente educativo. Condiciones de desarrollo pedagógico.

Introduction

The 21st century will be the century of information and scientific knowledge, which means that the education system will have to solve a fundamentally new global problem of preparing millions of people for life and activity in a completely new environment of the information world (GONZALO *et al.*, 2017; SOUSA; ROCHA, 2019). It is a complicated matter of raising the education level and level of forming a new way of thinking, adapted to the rapidly changing economic, social and informational realities of the world (LEVINA *et al.*, 2017; WU *et al.*, 2018). To date, there is an obvious need to reconsider traditional approaches that have long been in effect in higher education but are incapable to solve all the problems of training a future specialist in the context of an information society transition (VLASOVA *et al.*, 2018; KONONETS *et al.*, 2020).

Today's reality proves that the student is increasingly required to be able to incorporate an increasing information flow into his/her activity system independently, not only professional, but also directly unrelated to professional, critically assess information phenomena, defend his/her individual position in relation to ambiguous and contradictory information processes etc. (MUKHAMADOVNA *et al.*, 2020).

Thus, the continuous nature of the educational process increases the requirements for the student's personality and activities and demands, above all, the ability to collect, process and analyse any information, which in its turn implies a high development level of his/her information needs (GUZMÁN-SIMÓN *et al.*, 2017; VAGANOVA *et al.*, 2019).

Instability and uncertainty of social system, provoked by constantly changing social and economic conditions - globalization, acceleration of society development rate, diversification of economy, increasing transparency and openness, introduction of information and communication systems - introduce conditions for student development as a full subject of educational process and change of his/her attitude towards received information, subject to information systematization and assimilation into the list of modern higher education system priorities (PHUNGSUK *et al.*, 2017).

The new education paradigm is focused on training and education of the younger generation, aimed at the development of the students who are capable and ready for creative efforts, self-actualization, and creation of something new in the field of information contacts and activities, which have highly developed information need in the information and educational environment of the university (UNGER; MEIRAN, 2020).

In order to address the socially significant tasks outlined in Russian Presidential Decree no. 204 of 7 May 2018 and function effectively in modern society, university graduates must have the ability to navigate in a saturated information space and be able to withstand the negative impact of the social environment.

Some problem aspects of specialists' information needs can also be referred to the sphere of higher education. However, to date, both in theory and practice of higher education, this problem is underdeveloped. Despite the active study of information and educational environment, the theoretical justification of approaches and pedagogical development conditions of future bachelor's information needs is not enough studied in information and educational environment (VAGANOVA *et al.*, 2019).

The aim of the article: to identify and prove the effectiveness of a set of pedagogical conditions for the development of information needs of future bachelors in the information and educational environment.

Methods

Theoretical and empirical methods were used in the study. Among the theoretical methods, we used action methods: problem-setting, hypothesis-building. Among the method-operations we applied: analysis, synthesis, comparison and generalization.

Carrying out conceptual analysis of the main research concepts "needs" and "information needs", we identified the main features, types, functions and structural components implied in the different authors' definitions. The next method was to compare these attributes and the content components that underpin the meaning of the concept. In identifying the most frequent features, we used generalization to clarify the underlying concepts.

In addition, we used the following experimental methods: methods-action (monitoring, generalization and experiment) and methods-operation (mathematical and graphical methods of processing the research results; survey and testing, expert evaluation method), the generalization method was used to summarise the results of processing the tracking of experimental data.

Learning and information skills were assessed in the monitoring according to the completeness and awareness index. The completeness coefficient was calculated using the formula: $k = n/N$, where n is the number of correctly performed actions by the learner; N is the number of actions included in the skill structure. Conscientiousness was determined by the validity degree of the student's actions when performing information retrieval, processing. Independence in learning and information activity was checked by the expert evaluation method in different kinds of information exercises.

The monitoring method was used to analyze, compare and explain the results of the experimental data. The central method was the method of the experiment, which was carried out based on the Federal State Budgetary Educational Institution of Higher Education "Nosov Magnitogorsk State Technical University", in which 104 second-year undergraduate students took part. The experiment was related to the implementation of the proposed pedagogical conditions for developing future bachelors' information needs in the information and educational environment of the university.

Hypothesis

In our study, we were guided by the following hypothesis that the development of future bachelors' information need will be more effective if:

- 1) types, functions, a structure of personal needs be clarified;

2) the concept of future bachelors' information needs has been clarified, their properties, types and place among other needs have been defined;

3) methodological approaches and principles of information needs development in university informational and educational environment are determined;

4) a complex of pedagogical conditions for the development of information needs in the information and educational environment of higher education institution is revealed and realized, including providing a student's personal attitude to the information by his transition to the "living knowledge"; expanding the students' information field by creating information deficit in future bachelors; constructing the situations of success in educational and informational students' activities.

Results and discussion

In addition to the numerous approaches to studying the concept of 'needs', an approach that explains human needs in terms of the relationship with nature and the social environment has proved to be acceptable in the light of our work. This is due to the fact that human beings live in this environment and are directly dependent on it. Moreover, these relations have the property of motivating a person to activity.

In refining the definition of future bachelors' information need, we focus on the reason actualizing their information need, as we have not found it in the existing definitions of scholars (VLASOVA *et al.*, 2018; UNGER; MEIRAN, 2020; KONONETS *et al.*, 2020). Based on the above theoretical provisions, we have specified that the future bachelor's information need is a form of learner attitude to information, arising from an objective information contradiction between the learner and reality, which is realized in learning and information activity.

At the same time, we consider a student's learning and information activity as a purposeful activity motivated by information need and aimed at the subject of its satisfaction in the learning process. Under the development of future bachelors' information need, we understand the process of their qualitative and quantitative changes in learning and information activity under the purposeful influence of pedagogical conditions, implemented in the information and educational environment of a higher education institution.

During the research, it was found out that the development of future bachelors' information needs has a stage-by-stage character, so we have distinguished three stages in it: pre-university, university, and post-university. Within the framework of this article, it is the university stage of information needs development that turns out to be of our interest.

We connect the development of future bachelors' information needs, first of all, with the process of its actualization in the information and educational environment of higher education institution. The appeal to the actualization concept was caused by the necessity to consider the characteristic features of the students' needs and information needs. Such information need property as periodicity allows speaking about its two states: potential and actualized. At the informatization present stage of the educational environment, the actualized state of future bachelors' information need is especially important.

Analysis of a number of studies on the problem of students' information need development allowed concluding that the information need actualization of future bachelors occurs due to a problem situation which occurs objectively, regardless of their will and intention as a mismatch between the available stock of information and knowledge and the tasks at hand (BULAEVA *et al.*, 2017; ALMAZOVA *et al.* 2020; DEMCHENKO *et al.*, 2021).

Therefore, it is important to create such problem situations in order to actualize the future bachelors' information need. By solving them, future bachelors learn to obtain, process, and present the knowledge and information required in the learning process in one form or another.

In the framework of the informational approach, information plays a dominant role. In our work, we consider the provisions according to which all relationships existing in nature are informational in character and the study of any object, process or phenomenon in nature and society, first of all, the most characteristic of their informational aspects are identified and analyzed. Relying on personality-oriented and activity-based approach implies considering a student and a teacher as genuine subjects of activities in the information and educational environment of higher education institution, building educational classes considering individual, age and other features of students, i.e., we proceed not so much from the discipline taught, as from a student himself and his abilities in the course of learning.

In our case, we analyze the pedagogical conditions of developing information needs in future bachelors in the information and educational environment of higher education institution, where we deal with external and internal circumstances, which are consciously created in the information and educational environment of higher education institution and provide the most effective development of the process. At the same time, it seems reasonable to interpret the university information and education environment as a pedagogically constructed space of a university formed through a wide range of information and communication technologies.

We believe that the effectiveness of developing information needs in future bachelors will increase if the following set of pedagogical conditions is fully implemented in the educational process:

- formation of learner's personal attitude to the information received in the course of study sessions by intensifying the process of information transition to the level of "living knowledge";
- expansion of future bachelors' information field through the creation of information deficit and information contradiction;
- constructing situations of success in educational and informational students' activity.

Let us discuss the results obtained during the implementation of the proposed pedagogical conditions by the main criterion - the level of future bachelors' information needs during the experiment.

The first one is related to the necessity of improving Bachelor's learning and information skills and competences. This process is based on the student's organization of his/her learning and information activity, information search, processing, systematization of the available volume of educational information and its creation, transformation into his/her own living knowledge.

According to the survey, students most often work with documentary information, represented by textbooks, lecture notes, articles from Internet sources, periodicals and reference literature etc., as well as with verbal information. All of this is based on working with either written or oral texts, educational portal materials.

As part of our work, we define the learning and information skills as the skills that ensure finding, perceiving, processing, transmitting, storing and using all types of information to solve learning tasks.

We have identified documentary and verbal information as the dominant information types, while numerical, graphical information and pictures are regarded as secondary. Information processes include searching for, perceiving, processing, transmitting, storing and using these types of information in information and education environment.

The process of transforming information into knowledge can be intensified through certain exercises and tasks ensuring the improvement of students' existing learning and information skills and the development of new ones, as well as by applying such methods and techniques which allow expressing a personal attitude towards information and, thereby, help students in creating, organizing their living knowledge, actively using all the information and education environment resources as much as possible.

We interpret student's information field as a subjective reflection of information space and information-educational environment in consciousness (ALDOWAH *et al.*, 2017; UNGER; MEIRAN, 2020). Information need as one of the student's information field components is, thus, in direct interdependence with student's experience, individual characteristics and other needs.

Also, we have come to the conclusion that the organization of learning and information activity oriented to a future bachelor has a positive impact on the sphere of his interests, motives, determining needs of a given personality. This is reflected in the actualization of the needs related to the students' information need. Such needs include the need for self-development and, as arising on its basis, the need for self-affirmation, self-expression, and self-actualization.

We have found that the information deficit situation, actualizing their information needs and involving them in purposefully organized training and information activities in the information and educational environment of the university allows expanding the students' information field, and therefore develop their information needs.

The next condition for the successful development of information needs, as the study showed, is the construction of success situations in students' educational and informational activities. In proposing this condition, we were guided by the notion that emotional body saturation is an important innate and life-developing human need. Emotions and feelings act as significant success determinants of learning activities, so it is necessary to rely on their emotional sphere in the future bachelors' learning process.

We believe that the design of success situations for future bachelors in the learning process will be possible if

1) during learning and information activity a student has an opportunity to choose information source and type, a way of its processing and presentation in accordance with his/her individual features, interests, desires;

2) organized learning and information activities allow students to act independently and contribute to the discovery of their creative talents;

3) teacher and students build their interaction on principles of equality, mutual respect, mutual understanding and empathy, co-authorship and cooperation, i.e., communicate at the level of interpersonal dialogue;

4) the teacher uses a number of psychological and pedagogical methods of creating success situations for students in the learning process.

The aim of the experimental work was to check the effectiveness of pedagogical conditions for the development of future bachelors' information needs. We identified three development levels of future bachelors' information needs: low, medium and high. The main indicators to assess the development level of future bachelors' information need were selected: cognitive activity, learning and information skills, independence of students.

Table 1 shows the results of the experiment in the control and experimental groups. Their comparison allows us to note a stable growth in the respondents who moved to a higher level of information need during this experiment.

Table 1 - Changes in the distribution of respondents by level of information need among future bachelors during the experiment

Groups	Levels of future bachelors' information need					
	Low level		Middle level		High level	
	quantity	%	quantity	%	quantity	%
EG -1(b)	17	62.96	5	18.52	5	18.52
EG -1(e)	9	33.33	9	33.33	9	33.33
EG -2 (b)	14	56.00	6	24.00	5	20.00
EG -2 (e)	7	28.00	8	32.00	10	40.00
EG -3 (b)	16	61.54	5	19.23	5	19.23
EG -3(e)	5	19.23	9	34.62	12	46.15
CG(b)	16	61.54	5	19.23	5	19.23
CG(e)	14	53.85	6	23.08	6	23.08

Source: Devised by the authors

An analysis of the experimental data reflected in Table 1 shows an overall increase of 2.07 times in the number of respondents with a high level of information needs in the experimental groups and a decrease at the low level of 2.24 times.

Let us examine and compare the dynamics separately by groups. In EG-3 where the complex of pedagogical conditions was introduced, the number of respondents with high promising level at the end of the experiment was 46.15%, which is 2.40 times more than at the beginning of experimental work. This is the highest result compared to other groups.

In EG-1 (where one condition was implemented) the increase was 1.80 times. In EG-2 (where the 1st and 2nd pedagogical condition was implemented) positive growth was also observed: at the end of the experiment the number of future bachelors here with a high level of information need increased 2.00 times compared to the beginning of the experiment.

In CG the number of future bachelors at a high level increased insignificantly, namely, 1.20 times.

The number of bachelors with a low level of information needs decreased during the formative experiment. Their number in EG-1 decreased 1.89 times, in EG-2 - 2.00 times, in CG - 1.14 times, in EG-3 - 3.20 times.

So, the given analysis of the experiment proves that the realization of pedagogical conditions provides effective development of future bachelors' information needs in the information-educational environment of higher education institution.

Hypothesis testing in the experiment was carried out using Pearson's chi-square statistical test. The results of the calculation are presented in Table 2.

Table 2 - Statistical data of the experiment in assessing changes in the level of future bachelors' information need

Groups	χ^2 value obs.	χ^2 crit. value	P
CG and EG-1	2.27	5.99	0.3216
CG and EG-2	3.60		0.1652
CG and EG-3*	6.86*		0.0323*

"*" indicates groups with significant differences

Source: Devised by the authors

The data in Table 2 confirmed that the implementation of the two proposed pedagogical conditions is not sufficient to develop the level of future bachelors' information need effectively as $\chi^2_{obs.} < \chi^2_{crit.}$ ($2,27 < 5,991$ и $3,60 < 5,991$). Statistical significance for the development of bachelors' information need is confirmed only in EG-3 with the introduction of a set of pedagogical conditions, as $\chi^2_{obs.} > \chi^2_{crit.}$ ($6.86 > 5.991$).

The "P" value (probability of null hypothesis validity) was also calculated for all indicators, with $P > 0.05$. The data in Table 2 confirms that there is no significant difference in groups in EG-1 and EG-2 compared to CG as $0.3216 > 0.05$ (for EG-1 group) and $0.1652 > 0.05$ (for EG-2 group). And in EG-3 group a reliable difference is confirmed with CG group as here $P < 0.05$ ($0.0323 < 0.05$).

Conclusion

Considering the stated problem specificity, the development prospects of the educational process of higher education institution in the transition to the information society were determined. Their definition allowed substantiating the necessity and possibility of developing undergraduate students' information needs in the changing education conditions within the framework of information and educational environment.

The problem of developing future bachelors' information need in the information and educational environment of higher school is solved by the authors from the standpoint of three interconnected approaches informational, systemic, activity and personality-oriented.

The development of future bachelors' information need takes place in educational and information activity within the framework of informational and educational environment and has a phased nature, coming out at the university stage. The levels of development of students' information need are represented by low, medium and high levels, which are determined by such criteria as cognitive activity, learning and information skills, independence of future bachelors.

The effectiveness of developing information needs among university students is ensured by implementing a set of pedagogical conditions aimed at forming a learner's personal attitude towards acquired information through its transition to the level of "living knowledge"; expanding the information field of students by creating information deficit in future bachelors; constructing situations of success in educational and informational students' activities.

The analysis of the quantitative and qualitative experiment results showed that the hypothesis was confirmed. The statistical significance of the obtained data was proved by applying the statistical criterion "chi-square".

We believe that the proposed materials can be useful for researchers and teachers of various universities when working with future bachelors. Further work can be devoted to finding promising directions for expanding information and digital resources of the educational environment, increasing its socializing potential in the development of students' information needs, the continuity of the studied process when working with undergraduate and graduate students.

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