THE PECULIARITIES OF UPDATING THE INTERCONNECTION OF NEUROSCIENCE AND EDUCATION IN THE DISSERTATION DISCOURSE

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Abstract

The modern system of education cannot be developed without taking into account new data obtained through scientific research. Nowadays the neuroscience as cross-disciplinary area of a research of cognitive activity and emotions was allocated: a cognitive response, an involuntary empathic reaction, neuromodeling reaction, etc. The purpose of this article is to define the main directions and themes of research of problems of modern cognitive science in the context of education. The object is 500 dissertation researches during the period of 2010-2016 included in the catalog of the Russian State Library. Research methods are: content analysis, analysis, interpretation, comparison, generalization. On the basis of the content analysis by allocation a category of analysis, "cognitive science," is established and characterized in the group of directions science, including research on pedagogy and psychology is only 12%, and the philosophical research associated with the problems of knowledge – 1%. It is shown that in pedagogical dissertations primary attention is paid to the studies of intellectual and cognitive capacities of University students (80% of the total number of dissertations). Dissertation on the formation of cognitive and cognitive-communicative competence in the framework of different models of learning is described in psychological dissertations, preference is given to the study of cognitive processes among patients, infants or in situations of stress. The conclusion is drawn about the presence of many unexplored challenges associated with changes in mental activity in the conditions of introduction of information technologies.

Keywords: Neuroscience, cognitive science, education, content analysis, dissertation, idea of research.

1 INTRODUCTION

The modern system of education cannot be developed without taking into account new data obtained through scientific research. Science is an area of human activity aimed at elaboration and systematization of objective knowledge of reality. The basis of this activity is the collection of facts, their constant updating and systematization. Based on critical analysis and synthesis of new knowledge and/or their generalizations describe the observed natural or social phenomena. Scientists establish causal relationships and use them to predict future development trends of phenomena or processes, formulate laws of development of nature and society. Despite the fact that the problem of determining the historical stages of the development of science does not cause significant discrepancies among modern theorists of science. There are different approaches to the classification of research areas in different countries. According to the topic of this article, we can note that pedagogy as an independent branch of scientific knowledge is actively developed [1] and, like other Humanities, is influenced by General trends in the development of science [2]. A degree in educational Sciences is conferred after defense of a thesis. However, in some European countries, for example, in modern Germany, it relates to the field of philosophical knowledge. Pedagogy is understood as applied philosophy [3]. Its focus is to help people understand the world and define the place in it.

The Russian Federation is actively included in the system of global ties in science and education [4]. In the Russian Federation the list of scientific disciplines that awarded degrees that are enshrined in an official document, is called "the Passport of scientific specialty" and is digitally coded. A feature of the Russian approach is the integration of sciences such as physics and mathematics. These sciences are awarded the degree of doctor of physical and mathematical sciences. Passport of scientific specialties is united in the official list. It is approved by the Higher Attestation Commission and published on the website of the Ministry of Education and Science [http://vak.ed.gov.ru/316]. In some passports of scientific specialties specified interdisciplinary field of research as separate positions. Often, however, new scientific knowledge thematically belongs to several specialties.
Nowadays the neuroscience as cross-disciplinary area of a research of cogitative activity and emotions was allocated: a cognitive response, an involuntary empathic reactions, neuromodeling reaction, etc.

The purpose of this article is to define the main directions and themes of research of problems of modern cognitive science in the context of education.

2 METHODOLOGY

The presentation of the results of long and deep research is the dissertations. Their lists were combined into directories that are important and interesting array of empirical studies.

In this article, the object of research is around 500 dissertations researches defended during the period of 2010-2016 included in the catalog of the Russian State Library. We took into account of the dissertations, in which the directory was used the year of graduation, and those, which belonged to the category of "no year", but were included by the drafters of the directory in the list of dissertations of a certain year. The object of the research also included dissertations which were not designated place of defense. No distinction was made between doctoral dissertations and master's level accepted in Russia. The purpose of the article defines the logic of the study and includes several sequentially successive stages. The study was conducted in three stages, each of which had its own research problem.

The first stage of the study is devoted to determining the distributions of dissertations on cognitive issues relating to various branches of science in accordance with the Russian "Passport of scientific specialty".

The second stage focused on identifying the specific dynamics of research interest in this subject in chronological order.

The third stage of the study analyzes the thematic distribution facing the problems of education in General.

Research methods are: content analysis, analysis, interpretation, comparison, generalization. The semantic category of analysis and unit of search request content-analytical research was the concept of "cognitive science". Semantic units (categories) of the content analysis also presented a variety of working units, including explicit reference to the lexical units of "cognitive science" and its use in cognate pairs, with recognizable force. The unit of account was the thematic dissertations.

Data obtained in the study are recorded in a code table in Excel and visualized as histograms.

3 RESULTS

3.1 The first stage of the study

The first phase of the study is devoted to determining the distributions of dissertations on cognitive issues relating to various branches of science in accordance with the Russian "Passport of scientific specialty". As already noted, in the Russian science as a codifier, in which defined areas of science and passports scientific specialties. In this part of the study we proceed from the restrictions under which are determined only by the field of science by the General code. The cipher shows the membership of the dissertations to a science (http://vak.ed.gov.ru/316).

1462 dissertations on various aspects of cognitive science are presented on this subject. The chronological period of the dissertations in cognitive science is from 1983 to 2016. 528 of the defended dissertations were detected and accounted for in the period from 2010 to 2016. The results of the content-analytical study are shown in Figure 1.
As the histogram shows, the greatest interest issues associated with cognitive problems, showed the representatives of philological Sciences. A group of Philology is quite large – it includes 16 research areas, eight of which are listed in the directory under the search term "cognitive science". Within medical research, who are in second place on the frequency of references to this issue as the authors of the dissertations, 51 of the codified aspects of scientific research, representing the medicine, the problems of cognitive disorders are presented in seven passports of scientific specialties. Primarily this subject is considered in the framework of nervous diseases, where it prevails the problem of cognitive impairment is influenced by various factors. Educational subjects in medical research is not affected despite the fact that many of the thesis are devoted to the problems of children’s cognitive disorders. The cluster of dissertations on pedagogical and psychological Sciences presents the average amount of thematic distributions. Noteworthy is the fact that the philosophical work that should stand the problems of knowledge, occupy a modest place in the list of dissertations behind, including technical Sciences. Technical Sciences are actively considering the issues associated with the study of cognitive and semantic methods and algorithms.

### 3.2 The second stage of the study

The second block of the study is devoted to determining the interest of Russian researchers in the problems of cognitive science in chronological dynamics. When conducting a content-analytical study, the total number of dissertations in all scientific fields was taken into account. The results are shown in Figure. 2.

As can be seen from the histogram, for seven years there has been a pronounced downward trend characterizing the research activity concerning the problems of cognitive science in General. The
maximum of dissertations is 102 in 2013. However, this surge of activity researchers may not affect the overall downward trend. The minimum number of defended dissertations is only 31 in 2016. Distribution to the individual sciences is presented in Figure 3.

![Figure 3](image)

As the analysis of polygon distributions of dissertations on philology, medicine, pedagogy and psychology (they make up the bulk of the case studies), all branches of science demonstrate a downward trend in the field of research problems of cognitive science. Philology and medical science give the greatest decline. Psychology and pedagogy with a General downward trend shows relative stability of interest of researchers to problems of cognitive Sciences.

### 3.3 The third stage of the study

The third phase of the study analyzed the content of dissertation research in their pairing with the problems of education.

In the framework of philological Sciences, the problem of cognitive science has been studied most actively. There are a considerable number of dissertations in which the authors consider linguistic problems in the context of cognitive-discussional paradigm. This is evidenced by the titles of the dissertations. The problem of education as empirical array for philological research appears only three times. Examines cognitive-discursive representation of the image of the University [5], metaphorization of the cognitive region "study" [6], and especially Christian preaching [7], which is a factor of formative influence.

The authors of pedagogical dissertations address the problems of cognitive science in the following cases.

1. The term "cognitive" is used in describing pedagogical approaches to the formation of knowledge and skills [8]. In this case, the term is used with additional connotations: cognitive-style approach [9], cognitive-discursive approach [10], competence-cognitive approach [11], cognitive-communicative approach [12]. The analysis shows that all the authors of the dissertations proceed from the idea that the main role in human behavior, playing knowledge, which are forms of representation of objects of the external world. Connotations in the definition of this approach allow us to deliver logical and meaningful emphasis on some aspects of the use of this approach.

2. The term "cognitive" is used in relation to the characteristics of competence and competencies or their components: cognitive competence as such [13, 14], linguistic and cognitive competence [15], cognitive-communicative competence [16], the cognitive component meta-linguistically competence [17], the cognitive component of health-competence [18]. Cognitive competence is understood as ability and willingness to cognitive activity associated with processing of information to achieve a purpose, usually to solve problems or tasks. In total, the study turned to the practice of universities and training students, make up more than 80% of the total number of pedagogical dissertations.
The topics of the dissertations are as close as possible to the solution of problems of psychology, reflecting aspects of the cognitive perception of text [19], cognitive development [20] and cognitive-emotive speech skills [21], cognitive abilities [22], cognitive styles [23]. It should be noted that in dissertations on psychology is not observed tendencies to the study of educational problems in the context of cognitive aspects of students. The interest of researchers caused the problem of formation of cognitive strategies for understanding figurative teaching material by pupils [24] and the influence of individual peculiarities of cognitive development in mastering the skills of reading and writing in primary school [25]. In psychological dissertations, preference is given to the study of cognitive processes in patients, or infants in a situation of stress. Comparison with the number of dissertations on Philology (three of them) shows that psychologists pay too little attention to the various aspects of pedagogical issues.

A total study associated with the teaching issues and problems of education in General make up less than 12% of the total number of dissertations for the period 2010 – 2016 Philosophical studies, facing the problems of education are less than 1%. 80% of educational research is devoted to the problems of cognitive activity of students and teachers of universities.

4 CONCLUSIONS

Thus, the problem of the influence of cognitive science on education and pedagogy is a fundamental scientific problem. The study of cognitive processes of human activity, patterns of cognitive process, features of cognitive activity in the context of specially organized training (including teaching and teaching) and the impact of the education system embodies considerable potential. The new data will help to make more effective the activities of teachers and students of all typological groups.

Currently Russian science is declining interest in the subject. The relative stability of the number of studies on the pedagogy associated with the introduction of Russian Federal educational standards for higher education. They are based on the competence approach, i.e. determine the list of competencies that must possess a graduate educational program. This explains the appeal of researchers to the problems of cognitive competencies. However, this type of competence is not provided for in the Federal educational standards. The introduction of cognitive competence and its options for its representation, components of this competency evidence of the extension of scientific research and quest to find hidden reserves of modernization of the education system through the improvement of cognitive practices. There is a range of unexplored problems associated with changes in mental activity in the conditions of introduction of information technologies, which has not yet become the objects of special studies of researchers.

REFERENCES


