COMPETENCE IN THE STRUCTURE OF RESEARCH ACTIVITIES

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Abstract: The article presents various points of view on the concept of "competence", gives an author's interpretation of this concept. The essence and structure of competencies are considered, the relationship between competencies in the framework of research activities is determined.

Keywords: competence, competencies, research activities.

1 Introduction

Competency may be described as a level of intensity and demonstration of professional experience that a person has within the competence of a certain activity. In this context, we can define the research competences of a teacher as integral professional and personal characteristics, which determine the requirements of a teacher's abilities to realize the functions of their research activities: informational, analytical, predictive, planning, constructive, managerial, communicative, personal and reflexive function. In our opinion, the main function in a teacher's position as a researcher is reflexive. It contributes to the implementation of not only the pedagogical goals by a teacher - to find a good solution to a problem, to achieve positive result in activities, and make positive changes and improvements in the state of the students but also research ones - to find a reason, to justify a solution of the problem, and to identify ways for positive changes in the state of students, methods, and conditions to achieve this result (due to which this result was achieved).

The organizational and activistic block of research competences is characterized by the criterion of acquiring skills to organize research activities by a teacher. Mastering ways to carry out practical research activities by a teacher requires the ability to plan, organize and realize research activities. We classify such ways as (a) goal-setting, which includes the setting of goals for research, closely related with the goals of education and upbringing; determination of pedagogical and research tasks; the planning of a new educational system, and its forecasting; (b) diagnostics, necessary for the realization of current educational work, obtaining scientific facts, monitoring the process and results of research activities; (c) communication which allows the establishment of emotional and psychological contact with students and colleagues; builds interaction with students during the educational and upbringing process based on cooperation, trust and goodwill in communication; (d) the process of decision making is the process to select one variant from several possibilities.

The competency-based approach and the concept of competence associated with this approach have become quite well established both in the world and in domestic pedagogy. (1, 2). This concept is found today in the legal acts regulating educational activities, and in the teaching materials used by teachers at all levels of the educational system. Nevertheless, many problems of the competency-based approach remain unsolved both in methodological and methodological terms, which results in sufficient convention and inefficiency of both the process and the results of educational activities based on this approach. Therefore, at the level of theoretical analysis, most

pedagogical researchers find it difficult to interpret the concepts of a competency-based approach and their correlation with other pedagogical categories. (3-5) The big question is also the qualitative and quantitative characteristics of competencies. However, practicing educators are forced to form competencies among students, which, according to various scholars, are either personal qualities or a combination of knowledge and skills. (6, 7) At the same time, at the organizational and methodological level, the competency-based approach did not offer anything new, therefore, practice teachers work using long-established forms, methods, and techniques of pedagogical activity. (8, 9) It is clear that, without a solid methodological foundation, the educational process today risks becoming an eclectic set of pedagogical events, the results of which are at least unpredictable.

2 Materials and Methods

An analysis of studies on this problem showed that most scientists, as a rule, study individual aspects of competence, competencies and their particular types. Some consider professional and pedagogical competence; others study educational-cognitive, social and professional ones, etc. (10, 12)

One of such private types of competence of a specialist in research, presented in the federal state educational standards for the training of bachelors and masters. The content analysis of the texts of educational standards revealed an infinite variety of types and directions of research activities presented in the respective competencies. Nevertheless, the analysis and comparison of the formulations of scientific research competencies presented in these documents allow us to conclude that the basic invariant structural components of scientific research competence are determined by knowledge, abilities, and abilities to carry out various types of scientific research activities.

Thus, the absence of a generally accepted concept of the competence structure of the subject of activity leads to the fact that both in the draft standards and the research literature a huge range of types of competencies is presented, which, being devoid of an invariant basis (invariance is the property of any object does not change with changing conditions in which it operates) often does not meet the criterion of completeness and representativeness. (12)

Therefore, clarification of the essence and relationship of the concepts of research competence and research competence is an extremely important methodological issue that needs to be resolved. Analysis has revealed an infinite variety of approaches to the definition of the term "competency", and differentiation in the understanding of the concept of interest is observed not only between different areas of scientific knowledge but also within a particular science. It must be noted that today in pedagogical theory there is no unambiguous definition of the term competence, and its essence, as a rule, is interpreted depending on the aspect of the study of the problem: qualification characteristics, the orientation of vocational training, type of activities carried out, etc.

Nevertheless, it seems possible to systematize most of the definitions of the term competence, deduced by domestic teachers, within the framework of the three main psychological and pedagogical schools of the largest scientists who study this problem. So, in the framework of the functional school, the term "competency" is used to designate the integrated characteristics of the quality of graduate training, categories of educational outcomes. Theological school characterizes competence as a set of subject skills in a special way to structure scientific and practical knowledge to better solve problems. However, the most widespread in modern educational practice was the school of humanistic education, in the framework of which competence is defined as the possession of the relevant competence including the attitude to it and the subject of activity.

3 Results and Discussion

The whole diversity of the above examples of definitions of competence by representatives of pedagogical science is reduced mainly to the issue of the component composition of competence. Some scientists reduce it to the sum of knowledge, skills acquired during the educational process, others add a set of personal characteristics to this composition, others associate it with the presence of certain personal qualities. However, the search for almost all researchers converges on the idea that a particular competency is associated with the experience of the relevant activity.

V.V. Kraevsky (13) emphasizes that competence requires a minimum of experience in applying competency. M.A. Cold (14) believes that "the difference between a knowledgeable and competent person is intuitive to everyone. Compare, for example, a knowledgeable doctor and a competent doctor: a knowledgeable doctor knows and tries to treat, while a competent doctor knows and cures."

An essential point in understanding competence, in this case, is a specific situation in which generalized knowledge should turn into a specific algorithm or procedure of actions leading to a successful result. Hence, the concept of competence that is characteristic of a European understanding is the establishment of a causal relationship "competence – success." (15).

S.G. Thieves and E.V. Orlova (16) directly indicate that competence is the experience of the successful implementation of a particular type of activity, and they believe that it is not only being formed and improved but also manifests itself in his activity."

Accepting these ideas, we can conclude that competence is not reducible to knowledge, skills, personal qualities, as well as their totality, but is only determined by them.

Following this logic, it is appropriate to quote the words of V.I. Sakharova (17) that competence is an estimated category; it characterizes a person as a subject of specialized activity in the system of social development of labor with bearing in mind the level of his development, his ability to competently make adequate and responsible decisions in problem situations, to plan and perform actions leading to rational and successful achievement of goals. In other words, competence is the ability to work with knowledge of the matter and moral responsibility.

The appraisal of the term competence is confirmed by examples of its use in speech. The analysis showed that, as a rule, a colleague, clients who evaluate the results of the activities performed by this person, are called a competent specialist. A competent or incompetent specialist is a representative of any profession, not based on the level of his professional training or the duration of his work experience, and above all, depending on the effectiveness of his activities, which can be characterized by the concept of quality. In the aspect that interests us, quality is a combination of the results of labor activity, determined by the ability and desire of the employee (team) to perform a specific task following the established requirements. When the results of the work are positive, and in general, the activity is successful, the person who carried it out is called competent. On the contrary, if the activity is unsuccessful and ineffectual, then no matter how much time and effort a person has spent on its implementation, he will be called incompetent.

We consider it expedient to single out three main orientations for determining the structural elements of scientific research competence. The first orientation can be attributed to the division of competences, into two main groups - general and professional, which is most clearly represented in the state educational standards for the training of bachelors and masters.

For the second orientation, the structural content of research competence is formed by various component composition. The analysis of studies on the problem of scientific research competencies made it possible to establish various variants of the component composition of scientific research competence, filled with combinations of motivational, orientational, operational, volitional, evaluative and other components. However, at the same time, the question remains unanswered that if the research competence already has one or another component, for example, a motivational one, can it be present again in the structure, for example, of scientific research activity in which this competence is realized.

Finally, the third direction in determining the structure of research competence is associated with the search for a number of its forming competencies.

The analysis of the above examples allows us to talk about a certain hierarchization of competencies included in the structure of research competence. We are interested in the approach to the substantiation of this hierarchy since it is not clear why, for example, this or that competence is included in the structure of scientific research competence. So, for example, analytic-reflective competence can just as well be included in any other competence, for example, creative.

Therefore, before starting to determine the composition of scientific research competence, it is important to determine the basic structural elements of competence as a generic concept, referring to its interpretation. The effectiveness of the implementation of any activity is determined by competencies, understood as a combination of knowledge and skills. At the same time, the totality of certain knowledge, skills, and abilities necessary for the effective implementation of one of the stages of scientific research may be useless at another stage. Therefore, for example, the skill associated with the detection of contradictions is important at the initial stage of research and does not represent any value at its other stages. In this regard, there is a need to search within the competence of its structural elements that would most fully correspond to the procedural structure of a particular activity. Research activity has a specific process structure, each stage of which involves a special type of researcher action. At the same time, it makes sense to designate these elements with the term "sub-competence", since their combination forms integral competence, and the used prefix "sub", according to Ozhegov's explanatory dictionary (18), forms nouns and adjectives with the meaning of secondary, subordinate, small in comparison with what named in a manufacturing basis.

Since the process of research activity consists of four main stages, it becomes appropriate to divide research competence into the number of sub-competencies corresponding to these stages.

Considering the first stage of research activity, which consists in posing the research problem, it should be noted that the clarification of the degree of problematicness. It means that the ratio of the known and the unknown in the information required to be used to solve the problem is called cognition, and therefore, it will be appropriate to name the set of knowledge and skills that ensure the success of this process with cognitive sub-competence.

The next stage of research activity is research planning, the basis of which is the formulation of assumptions - hypotheses. Since a specific method of searching for hypotheses is called abduction, it is possible to designate the sub-competence ensuring the success of this process as an abductive one. (19)

The logical consequence of putting forward the research hypothesis is the search for arguments by intending to provoke or enhance the sympathy of the other side for the advanced position, which is called argumentation. (20) In this regard, the name of the sub-competency that ensures the success of the third stage of research activity related to the implementation of research methods may sound like an argument.

When the experimental plan is completed successfully and appropriate measurements are taken, the researcher proceeds to assess

The results of the study, serving as the final stage of research activity. Since verification, empirical confirmation of the theoretical principles of science by comparing them with observable objects, sensory data, and experiment is called verification; the sub-competence corresponding to the final stage of scientific research can be called verification.

Thus, it seems possible to single out cognitive, abductive, argumentative and verification sub-competencies in the structure of scientific research competence, formed by a specific set of knowledge, skills, and abilities, specific for each of them.

Research sub-competencies implemented at each stage of research activity determine its success, and at the same time, the development of research competence as a whole.

4 Conclusion

The implementation of the first stage of research activity, which consists in posing the research problem, is possible when the researcher has a sufficient level of knowledge about phenomena and processes that cause anxiety, the ability to formulate the problem using a scientific language, as well as the skills to choose the object and subject of research, forming cognitive sub-competence.

The successful completion of the second stage of research activity, involving the planning of research, implies that the researcher has special knowledge about the object of study, the ability to use various imaging techniques, as well as the skills to explain the causes of any phenomenon that form abductive sub-competence.

The next stage of research activity related to the implementation of research methods may succeed when the researcher knows theoretical and empirical research methods, the ability to search for hypothesis testing and the skills of applying research methods that form argumentative sub-competence.

Finally, the final stage of scientific research, involving the evaluation of the results of the study, can be successful if the researcher has knowledge of how to verify the results obtained during the study, is able to measure the dynamics of processes and phenomena, and has the skills to process and analyze information that makes up the verification sub-competence. Thus, the analysis allowed us to draw the following conclusions:

- Research competences are interrelated and interdependent categories, with the first concept applicable to the process of research activity, and the second to results;
- Research sub-competencies determine the success of each stage of research activity;
- Research competency, which is the criterion for the success of research activities due to the presence of research competence.

The constructive level of mastering research competence (level of theoretical schematization, strategic), is characterized by the ability to independently define a problem, conciseness, and theorization, and a level of complete mastering skills to plan and predict. There is the possession of fundamental notions in the structure of methodological and scientific knowledge and the application of empirical and theoretical research methods in his/her activities. Theoretical knowledge is characterized by consciousness, generality, and breadth of the transfer. Processes of self-organization, self-regulation, and communication are clearly demonstrated in research activities; a system of research competences is established. Thus, the structure and content of research competences are determined, the levels of their development dynamics are described, and such levels may be used to identify criteria to determine the efficiency of the development of research competence.

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Primary Paper Section: A

Secondary Paper Section: AE, AF