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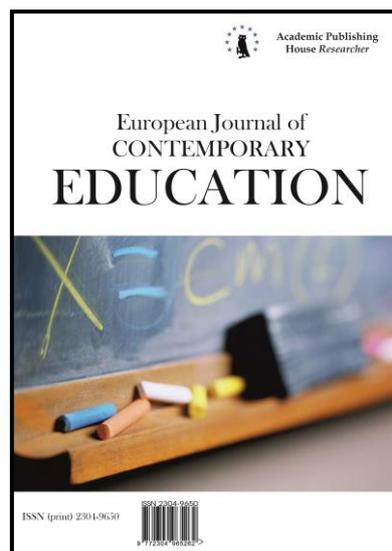
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## Interrelation of Evaluation and Self-Evaluation in the Diagnostic Procedures to Assess Teachers' Readiness for Innovation

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### Abstract

The paper solves the problem of the relationship of external diagnosis and self-diagnosis of readiness of teachers to innovative activity. It highlights major disadvantages of measurement tools that are used to this process. The author demonstrates an alternative approach to harmonizing the diagnosis, based on a modular diagnostic model, general diagnostic tools, to synchronize the management tasks of the process of readiness for innovation and self-innovation. The proposed approach, in the author's opinion, creates the necessary conditions for improving the quality of innovative activity of both teachers and ongoing modernization of education.

**Keywords:** teacher readiness for innovation, the relationship of external diagnostics and self-diagnostics, a modular diagnostic model, diagnostic tools, control specifications.

### 1. Introduction

Existing conditions of the innovative development in education feature an important element - the diagnosis of readiness of teachers to innovative activity. Such a diagnosis is implemented in different forms and involves harmonization of tools and expertise procedures with those of self-diagnostics.

If one conducts an analysis of approaches to the development of diagnostic material and studies the results of measurements (Voropaeva, 2014; Lazarev et al., 2015; Ponomareva, 2011; Prischepa, 2010), it is usually possible to detect significant gaps in the ontological structure of the innovation readiness, gaps between the essential characteristics of readiness, its indicators and indices, excessive detail of some characteristics and poor representation of others, the lack of

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important determinations, etc. These circumstances indicate definite disadvantages of the diagnostic tools and the need for its further improvement.

## **2. Method and materials**

The relationship of evaluation and self-evaluation of innovation readiness of the teacher should be reflected in the requirements for diagnostic criteria. These requirements define a general framework for shaping up the criteria. The conducted research has the following basic requirements that we observe: reliability, practicality, capacity to discern, validity (Deviatko; Magura, Kurbatov, 2007).

The initial material for the development of methodological bases to diagnose readiness for innovation tapped into the results of study of the nature and structure of psychological readiness (Dyachenko, Kandybovich, 1976; Nersisyan, Pushkin, 1969), as well as the study of problems of innovative activity of teachers conducted by V.S. Lazarev, B.P. Martirosyan (Lazarev, Martirosyan, 2006) E.P. Morozov (Morozov, Pidkasisty, 1991), P.I. Pidkasisty (Morozov, Pidkasisty, 1991) V.A. Slastenin, L.S. Podymova (Slastenin, Podymova, 1997) and others.

## **3. Discussion**

At the harmonization of tools and procedures of the external diagnostic and self-diagnostic of readiness of teachers to innovative activity, the following circumstances must be considered.

Firstly, the scope of diagnosis should include relative phenomena of diagnosis. The relative phenomena of diagnosis of the innovation activity, on the one hand, governed by the tasks of management of innovative pedagogical process. In this case, the results of the survey contribute to the optimization of decisions that are being taken. On the other hand, the relative phenomena of diagnosis are focused on the area of self-regulation tasks for teachers readiness to innovate, and the results of the diagnosis are designed to serve the processes of professional and personal self-development of a teacher.

Secondly, the external and internal diagnostics have their differences in the positions and attitudes of the participants. External diagnostics performed, as a rule, by heads of educational institutions, heads of methodological associations, specialists in the field of innovation – is conducted as an expert review. The experts more strictly adhere to the specified criterion-semantic units than do the teachers during procedures of self-analysis and self-assessment. Self-diagnosis is carried out autonomously by each teacher. However, his personal qualities are included directly in the system of self-analysis and self-assessment, in his view of the current level of readiness for innovation. Often the reasoning and self-esteem of the teacher can be interpreted only in the context of the innovative actions and in connection with the goals he sets for himself. This is especially true for self-analysis and self-assessment of motivational sphere of innovation, its value-semantic structure.

Thirdly, harmonization of diagnostics and self-diagnostics - is, above all, the question of harmonization of logic and semantics of performed procedures, and to this end, it is important to use a single diagnostic set of tools.

Development of diagnostic tools is preceded by the drawing up of the diagnostic model of innovation readiness. Creation of the model occurs through structuring of the semantic space of diagnostics in the form of a specific set of diagnostic modules. Separation of the diagnostic model to standalone modules gives flexibility to the diagnosis. Depending on the goals and objectives pursued by the diagnosis, there may be used not all diagnostic models but only certain individual modules.

The modular structure of the diagnostic model is based on the principle of availability of functional-level regulation to innovation, and also on the concept of value-and-meaning control of such readiness. At the same time, willingness to innovate is manifested as separate local structures. As part of the diagnostic module such local structures are represented by diagnostic units. They are, in their turn, divided according to their status into the main and auxiliary. The main diagnostic units form a dialectical couple of interrelated variables that reveal the essential core of a local structure. For example, the dyad of "values of innovation – meanings of innovation" allows assessing the ideological positions and attitudes of a teacher, motivational side of innovation activities.

Auxiliary diagnostic unit is also variable. It is regarded as a mechanism for the practical implementation of innovation. In this case, the auxiliary diagnostic unit appears as a marker of a causal link of both key variables, as well as a significant factor influencing the nature and content of their implementation. In this example, the value-semantic mechanisms of innovation activity play a role of such a variable.

Thus, each diagnostic module provides a unified description of a well-defined structure of readiness for innovation in the form of diagnostic tasks, diagnostic units (main and auxiliary) criterion and its indicators. As a result, we obtain a diagnostic model of innovation readiness of a teacher, which includes four Diagnostic Modules (DM1 - DM4).

**DM 1 "Activity-and-competence structure of readiness to innovate."** The module is designed for the analysis and evaluation of readiness for innovation by the *criterion - the potential of innovative activity*. The criterion gives an idea of how well teachers have mastered basic types of innovation activities and relative skills, specific to these activities. Indices of the criterion are (1) *activities range of innovation* and (2) *competence range of innovation activity*.

The innovative activity of a teacher is not uniform in its content. It is necessary to distinguish relatively independent activities, which take shape as a result of natural classification. Practice-oriented structure of innovative activity in the most general form is predetermined by:

- research activity;
- planning activity;
- communicative activity;
- experimental activity;
- management activity;
- competence self-regulation.

In the framework of each individual type of innovation there can be identified certain competences by which it is implemented. Here are examples of innovation activities and their respective competences on the basis of which, the assessment of the current readiness level is conducted.

\*(PC – Professional Competence)

Research Activities (*PC 1: mastery of ways and methods of analysis in the field of education in light of the influence of innovations; PC2: mastery of ways and methods of laying out acute educational problems, training and development of students; PC3: mastery of pedagogical innovation research methodology*).

Planning activities (*PC1: mastery of methodology to develop the concept and plan out development of the educational organization; PC2: mastery of methodology for modeling of the innovation process; PC3: the ability to structure one's teaching activities in accordance with the targets and requirements of the innovation process*).

Communicative activity (*PC 1: mastery of methods of presentation of pedagogical innovations; PC2: the ability to discuss issues of innovation activity in accordance with the rules of professional communication; PC3: the ability to work in a team to solve innovation tasks*).

Experimental activities (*PC 1: mastery of methodology of experimental work planning on the validation of the innovation process; PC2: mastery of methodology of research and experimental validation of the innovation process; PC3: mastery of experimental data processing*).

Management activities (*PC 1: the ability to make rational decisions in the field of modernization of education; PC2: the ability to plan the innovation process with consideration of interdisciplinary relationships; PC3: mastery of methods of organizing a collective innovation activity; PC4: mastery of the innovation process monitoring methods*).

Competence self-regulation (*PC 1: mastery of methods to self-assess the ability to innovate; PC2: the ability for self-planning of the readiness to innovate; PC3: the ability for self-development of the competencies to innovate*).

Making the analysis and evaluation of action-competence structure of innovation readiness, an important place is given to the practical mechanisms of implementation of the desired competencies. Such mechanisms reveal substantive competences and functional characteristics at different phases of their implementation. These primarily include:

- subject-analytical mechanism;
- practice-transforming mechanism;

- activity-regulatory mechanism.

Subject-analytical mechanism of competencies is related to the procedures of search and processing of missing information in the domain of innovation. This mechanism allows us to estimate the difficulties that arise for teachers within a particular competence in carrying out analytical activities.

Practice-converting mechanism of innovation competencies is associated with the modernization of the existing practice of education. It is based on related procedures (conceptualization, planning, experimentation, self-development, etc.) with a clear focus on the mastery of specific pedagogical innovation.

On the basis of the activity-regulatory mechanism there is implemented self-examination, self-assessment and self-correction of one's innovation. Obviously, the diagnosis should show how well a teacher is able to identify the emerging deviations and difficulties, to what extent has he/she developed ways and means of overcoming them.

**DM2 "Functional-role structure of willingness to innovate."** Innovative activity is characterized by the variety of role positions and functions, by the dependency of teachers on each other. In this regard, it is necessary to include in the ongoing diagnostic *the criteria of functional-role activity*, based on the following indicators: (1) *role definiteness* and (2) *role functionality*.

Roles need to be analyzed and evaluated from the standpoint of major groups. The concept of role groups is ultimately a reflection of the fact that the role of innovation activities may be different, as well as the fact that within a given situation there can be performed roles of different groups. In the diagnosis of the innovation readiness of teachers, one should distinguish three main groups of roles (A, B and C) (Tynnikov, 2015).

Roles of Group A are directly related to the implementation of the innovation process. Roles in this group reveal the interaction of the teacher with an innovative process. The group includes such roles: *analyst, expert, innovator, methodologist, planner, designer, coordinator, consultant, controller, methodologist with hands-on experience*.

Roles of Group B are directly related to the organization of interaction between participants of the innovation process. These roles are introduced in the innovation process in the form of functions, positions and appropriate forms of cooperation, specific to the discussion of the problems of development of education, specific conditions of the innovation process, forms of coordination and monitoring of innovation. At the same time business communication takes place in the form of business simulation, group discussions, debates, consultations, presentations, etc. The group includes the following roles: *initiator, organizer, moderator, critic, mediator, motivator, conflict resolution specialist, facilitator*.

Roles of the Group C are centered on the objectives of self-preparedness for innovation. This group should include such roles as *self-diagnosis specialist, planner, self organization manager, autodidactic, self-controller*.

Role steps are important in the event if they are adequate to the situation of innovation. Depending on the nature and content of such situations there considerably varies the role of characteristics of innovation. In the diagnosis of functional-role activities of teachers there must be evaluated role behavior with respect to situations such as:

- *the situation of the innovation team creation;*
- *situation of problematization of the innovation process;*
- *situation of planning of the innovation process;*
- *situation of business communication;*
- *situation of management of innovation process;*
- *situation of professional self-development.*

Function-role activity is implemented through specific mechanisms. The ongoing diagnosis should distinguish, first of all, the mechanisms that cover the main phases of the Functional-role activity:

- *role self-identification;*
- *positioning of the role;*
- *role interaction.*

The mechanism of functional-role identity is built on a premise that a teacher views himself as a subject of innovation and plays a specific role. The transition to the new role means a new role specification, and is accompanied by changes of previous roles and functions and obligations.

Functionally-role identity is limited in time and unthinkable without the knowledge of the rules and regulations of behavior within the role, without tapping into the special knowledge and skills, professional and personal experience of the teacher.

Functional-role positioning is an important condition for the inclusion of the teacher in the situation of innovation. Positioning is achieved by determining a teacher's place and role in the innovation process, development or adoption of the most important ideas for the innovative transformation, translation of innovative ideas in the process of collective decision-making.

The mechanism of functional-role interaction is characterized by a general business orientation, which implies quite clear ideas about the principles of role interaction, possession of professional communications skills in different contexts of innovation activities (team building, research for teaching innovations, creation of an innovative project, project discussion and others.).

**Dm3 "Task-operational structure of willingness to innovate."** The diagnostic module emphasizes the main feature of the subject field of innovative activity: A variety of practical problems of improving of the educational process. Analysis and evaluation of readiness for innovative activity is carried out by *the criterion of operational completion*. Indicators of the criterion (1) *holistic task structure* and (2) *operational completion*.

Innovative readiness involves stimulating teachers to use the system of innovative practical tasks, understanding of the baseline and posing questions about the unknown, their logic and common interconnection. In general, this corresponds to the interpretation of the problem as a text, expressing fixed information about the "situation" and the content of the question, the answer to which is contained in the data ("baseline conditions") ([Sociological Dictionary of Project Socium, 2003](#)). However, we must distinguish the concept of a problem situation and objective ([Psychology. Dictionary, 1990](#); [Tyunnikov, 2014](#)).

Here is the typological structure of innovation tasks segmented by the activity-functional base:

- *research and analysis tasks;*
- *planning and converting tasks;*
- *experimental and forming tasks;*
- *communicative and discursive tasks;*
- *managerial and organizational tasks;*
- *competence-regulatory tasks.*

The need to strengthen the focus of the professional work of the teacher to solve such problems is pointed out by many researchers ([Gavrilenko, 2008](#); [Kazakov, 2006](#); [Kharisova, Shukaeva, 2015](#)).

Operational structures is related to the methods and techniques of solving practical problems, and suggests that teachers have specialized groups of skills. Let's define the skill groups that are subject to analysis and assessment in the diagnosis of the innovation readiness of teachers.

Research and analytical tasks (*the ability of socio-cultural orientation in the field of education; the ability to identify the source of contradiction in the educational system; ability to identify main trends of development of education, etc.*).

Planning-and-converting tasks (*ability to identify problems of an educational organization, the ability to evaluate innovative ideas and proposals; ability to identify and assess the possibility of further development of an educational organization; the ability to develop a concept of an educational organization; the ability to develop a program for the development of an educational organization etc.*).

Experimental-and-forming tasks (*setting goals for an experiment; ability to plan an experiment; the ability to control the progress of an experiment, etc.*).

Communicative and discursive tasks (*presentation skills to show pedagogical innovations; the ability to express their attitude to an innovative activity; the ability to analyze statements; the ability to work in a team to solve problems of innovation, etc.*).

Managerial-and-organizational tasks (*ability to identify priority areas for the development of an innovative educational organization; the ability to plan the innovation process; ability to organize innovative activities; the ability to control an innovation activity etc.*).

Competence-regulatory tasks (*the ability to analyze and evaluate professional competences on the basis of reflection of an innovation activity; self-development goal-setting skills in the area*

of willingness to innovate; the ability to develop a program of self-development to master one's willingness to innovate, etc.).

When diagnosing task-operational readiness of the structure it is also important to take into account the mechanisms of practical implementation of innovation skills. Mechanisms determine the characteristics of different levels of application of skills, indicate knowledge and ability specific to each level. These include:

- *reproductive use of abilities,*
- *reproductive-and-creative use of skills,*
- *creative use of skills.*

Reproductive mechanism of innovative skill application means a reliance on the various kinds of regulations, procedures, algorithms. Improving the educational process in this case is carried out according to a certain pattern or predetermined by instructions in recognizable situations.

Reproductive-and-creative mechanism of skill application is basically built on the regulations and samples, with extensive use of individual elements of creativity.

Creative mechanism of implementation involves the use of skills as a means of building an innovative pedagogical process of new knowledge acquisition, non-standard ways to act.

**DM4 "Value-semantic structure of readiness for innovation."** The innovation activity is strongly influenced by psychological phenomena of consciousness, determining the value-semantic structure of readiness for innovation: the identity of the system, values, worldviews, personal meanings, motivational hierarchy. The primary tasks of the diagnosis in this case are the analysis and evaluation of readiness for innovation by *the criterion of value-semantic certainty*. Important indicators of the criterion are (1) *value-sense certainty of innovation*, (2) *value-sense certainty of self-development of one's readiness for innovation*.

For the innovative values to serve as the main targets and motivation of innovation activity, they should be meaningful. Furthermore, one should understand the value in modernization of education, recognize the social demand for innovation activity. Equally important is an understanding of the need to maintain an adequate level of innovative activity by means of professional self-development and self-education. In this regard, diagnostic of value orientations of teachers should primarily focus on the analysis and assessment of such structural elements of innovation readiness as:

- *social values of innovation* (quality of education, sustainability of education, the path of education in the long term);
- *professional and personal values of innovation* (creative self-fulfillment, leadership, openness to new experiences, professional responsibility, cooperation and team work, professional and personal self-development).

In its turn, the diagnosis of semantic elements of the innovation readiness of teachers should also include analysis and evaluation of the meanings of two kinds:

- *socio-cultural meanings of innovation;*
- *professional and personal meanings of innovation.*

The content of the concepts of value and meaning is associated with the concept of self-identification, which is regarded as self-determination, one's own pro-activeness, a conscious desire to take a stand; personal new-formation associated with the formation of the inner attitude, awareness of their social and professional functions, the need to solve the problems of one's own future, of the professional community (Rozov, 1998; Shokhin, Abushenko).

Value-semantic self-determination in the field of innovation is realized through certain mechanisms. Mechanisms of value-semantic self-determination are another important variable in the diagnosis that is being carried out. With their help, it is possible to identify weaknesses and gaps in philosophical attitudes and motivation of innovation, in willingness for creative self-fulfillment, reflection of innovative stance, involvement in the solutions of practical problems of innovative activity, in making of important decisions in the field of modernization of education, in understanding the need for professional and personal self-development, etc.

Above all, for the purposes of an ongoing diagnosis, there should be identified those mechanisms that cover the main phases of the value-semantic self-determination:

- *value-semantic strategy development;*
- *value-semantic conceptualization;*

- *value-sense reflection.*

Value-semantic strategic planning is focused on determining the prospects of innovative development of a particular educational process, and –appreciation of the value, meaning and prospects for professional and personal development of teachers.

Value-semantic conceptualization focuses on the formation of value-semantic foundations of innovation and professional and personal development of a teacher. First of all, it involves a detailed review of the relationship of values and meanings of their own innovation with the problems of its planning, organization and implementation, as well as with the problems of self-development of innovation readiness.

Value-semantic reflection defines how deep the values of a teacher and his understanding of the meaning of innovation correspond to the real conditions and possibilities of education. Diagnosis based on the mechanisms of value-semantic reflection reveals whether teachers are able to analyze their value orientations in the field of educational upgrades, demonstrate their innovative abilities, whether they are ready to decide on changing their values and meanings.

Therefore, in relation to the tasks of each module (DM1, DM4) there have been identified criteria, indicators and diagnostic variables. Thus, we have defined the methodological basis for selecting various system diagnostic tools.

In our opinion, the most succinct yet informative are the diagnostic tasks, structured as a matrix. We will show a matrix form of the diagnosis with the example of DM1 "Activity-competence structure of readiness for innovative activity" (see [Table 1](#)).

Basic and auxiliary variables set the meaningful framework and define the logic of the matrix. Completing the diagnostics it is possible to identify the parameters of the main types of innovation (the first basic variable) and those professional competences (second main variable), which ensure the implementation of these activities.

**Table 1.** Diagnostics Matrix of activity-competence structure of readiness for Innovative Activity

Types of Innovation Activity. Competences of Innovation Activity	Mechanisms of implementation of IA competences		
	subject-analytical	Practice-converting	activity-regulatory
<p><b>Research activity</b>  <i>PC1: mastery of ways and methods of analysis in the field of education in light of the influence of innovations</i>  <i>PC2: .....</i>  <i>PC3: .....</i></p>			
<p><b>Planning activities</b>  <i>PC1: mastery of methodology to develop the concept and plan out development of the educational organization</i>  <i>PC2: .....</i>  <i>PC3: .....</i></p>			
<p><b>Communicative activity</b>  <i>PC 1: mastery of methods of presentation of pedagogical innovations</i>  <i>PC2: .....</i>  <i>PC3: .....</i></p>			
<p><b>Experimental activities</b>  <i>PC 1: mastery of methodology of experimental work planning on the validation of the innovation process</i>  <i>PC2: .....</i>  <i>PC3: .....</i></p>			

<p><b>Management activities</b>  <i>PC 1: the ability to make rational decisions in the field of modernization of education</i>  <i>PC2: .....</i>  <i>PC3: .....</i>  <i>PC4: .....</i></p>			
<p><b>Competence self-regulation</b>  <i>PC 1: mastery of methods to self-assess the ability to innovate</i>  <i>PC2: .....</i>  <i>PC3: .....</i></p>			

In its turn, the nature and content of innovation and related competencies are strongly influenced by the mechanisms of their implementation (auxiliary variable). The levels of the practical implementation of each mechanism are measured against a barrier parameter in four gradations, and the result is entered in the diagnostic matrix. The obtained data allow to draw the conclusions about the current level of readiness of a teacher to innovative, based on the criterion of innovation potential with a differentiated assessment in terms of activity-related competence and competence completeness.

We have studied the problem of reconciling of the external diagnostic and self-diagnostic of teachers` readiness to innovative from the perspective of unified diagnostic tools. We must now consider the problem from the perspective of management tasks of innovative process and management tasks for professional self-development of a teacher.

Through the innovation process management one carried out the basic idea of the pedagogical innovation, which is to ensure proper quality of the educational system at the expense of its current renovation. At the same time management is defined by the targeted, organizing and regulating influence (through the system of administrative, scientific and methodical management of the educational institution) of the processes of implementation of pedagogical innovations, relationships and activities of all participants in the innovation process.

Innovative pedagogical process Management System, as well as any complex process, can be represented as a specific circuit, which includes analysis, goal setting, planning, organization, control and correction.

The decisive role in ensuring the proper quality of innovation is placed on self-regulation of innovation readiness. O.A. Konopkin considers the essence of self-regulation as a mental process, which provides the initiation, construction, maintenance and management by a teacher of all kinds and forms of external and internal activities (Konopkin, 2002).

Self-regulation of readiness for innovative activity is also possible in a specialized circuit. The circuit covers the procedures of professional and personal self-development of a teacher, and includes self-examination, self-development planning, self-organization, self-education, self-monitoring, self-correction. Dedicated components interact in the structure of self-regulation as key links in a single logical strand. Self-monitoring is becoming a significant element of self-regulation in innovation, if the indicators correlate with expert evaluation and are considered in the management of innovative pedagogical processes.

As you can see, the expert diagnosis of readiness for innovation and relevant self-testing should complement each other dialectically. The result is that each type of diagnosis has a dual function and plays a key role in the control circuit, and self-control circuit. In other words, internal and external diagnosis must simultaneously perform two basic functions: *object-planning*, which is reflected in the management decision process in the holistic educational process, and *subject-planning*, which is an auxiliary to diagnostic information with regards to the individual participants of the innovation process and, consequently, to their specific self-development programs.

#### 4. Conclusion

Matching external diagnostic and self-test readiness of teachers to innovative is aimed at solving problems of improving the innovation process and objectives of professional and personal self-development of teachers. Methodological key to the solution of the problem of diagnosis harmonization is the development of a common set of diagnostic tools and its application in two adjacent circuits – management of an innovative process and self-regulation of readiness to innovate. This approach fundamentally changes the nature of harmonization, and its implementation minimizes the innovative risks associated with the professional readiness of teachers.

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