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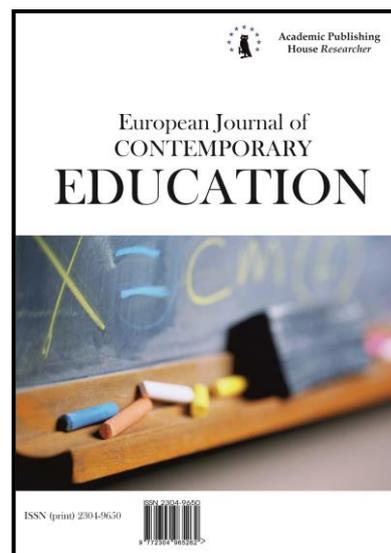
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Classification of Innovation Objectives set for Continuing Professional Teacher Development

Yurii S. Tyunnikov ^{a, b, *}

^a Sochi state university, Russian Federation

^b Institute of Strategy for Education Development of the Russian Academy of Education, Russian Federation

Abstract

The present demand for teachers, showing advanced aptitude for innovations, is an important reason for promotion of innovative practices in the continuous teacher training. For the on-going development of a continuous training system preparing teachers for innovative activities, it is necessary to have a complete taxonomy of practical objectives. They reflect in a certain way the diversity of innovative practices, and act both as an important prerequisite, and a starting point for generation of the main project solutions and procedures. The solution to the problem of classification tasks involves methodological justification for three fairly distinct procedures: definition of grounds for classification; building classification criteria, taking into account the essential characteristics of foundation classification; grouping tasks by specified criteria.

The article discusses the methodological approach to classification tasks innovation, built on the structural components of the subject-object relationship educator in the field of innovative change. Describes the structure of the classification criterion, a triad of classifications based on categories of subject-object relations: "the subject of innovation", "innovation", "relation between subject and object of innovation".

Keywords: teacher's innovation objectives, classification of objectives, subject-object approach to classification, the overall structure of a classification criterion, types of practical objectives, kinds of practical objectives.

1. Introduction

The need for continuing professional teacher development, as well as for greater efficiency of teachers' innovative activities, is essential by default, due to the urgency and value of the education

* Corresponding author

E-mail addresses: tunn@yandex.ru (Y.S. Tyunnikov)

continuity. The present demand for teachers, showing advanced aptitude for innovations, is an important reason for promotion of innovative practices in the continuous teacher training. Another, but in no way less important, reason is associated with availability of the continuing professional development system framework, embracing relevant methodological, theoretical and project-based materials, as well as instructors' manuals.

In provisions of this kind, practical objectives relating to innovative activities (hereinafter referred to as innovation objectives) play a significant role. They reflect in a certain way the diversity of innovative practices, and act both as an important prerequisite, and a starting point for generation of the main project solutions and procedures. However, when considering the content and process of teacher training designed to prepare teachers for innovative activities, one is likely to report a number of challenges primarily associated with the classification of innovation objectives, and methodological rationale for their types and kinds. The free composition and weak structure of the innovation objectives adversely affect the content of professional competencies, the learning objectives, the syllabi content and priorities, phased-in training design and development involving special didactic and diagnostic tools. Clearly, for the on-going development of a continuous training system preparing teachers for innovative activities, it is necessary to have a complete taxonomy of practical objectives. Meanwhile, the desk research on some educational innovations has revealed that the methodological feasibility of classification of teachers' objectives of innovative activities has not been specifically examined so far.

2. Resources and Methods

According to a number of researchers, classification serves a number of functions: explanatory, predictive, systematizing, synthesizing, methodological, practical (Kozhara, 1982; Meyen, Schrader, 1976; Subbotin, 2001).

Methodology of classification relies on the context of subject domains, initial assumptions, and principles (Kedrov, 1962; Rozova, 1986; Subbotin, 2001); it is expected to provide a fundamental outline of the classification structure (Kalygin, 2000; Fedotov, 2013), criteria (Rozov, 1995; Subbotin, 2001), methods and rules of the objects' clustering (Voronin, 1982). In this regard, there are heuristic opportunities for the subject-object modeling (Kireyeva, 2006), including the methodological potential of classification by the subject-object attribute of management decisions (Okhotskiy, 2008). When developing the methodology for the subject-object approach to classification of teachers' innovation objectives, the author has taken into account some earlier findings of his own research (Tyunnikov 2013; Tyunnikov 2014).

3. Discussion

In recent studies, various aspects of the system of continuing professional development designed to prepare teachers for innovative activities have been actively discussed: the composition and content of professional competences (Zvyagintseva, 2009; Shkerina, 2009), principles of modeling (Lazarev, Stavrinova, 2007; Slastenin, Podymova, 1997; Khutorskiy, 2008), the content of educational programs and learning technologies (Lazarev, Stavrinova, 2007; Slastenin, Podymova, 1997), specifics of the innovative information environment (Vaindorf-Sysoeva, 2009; Kazakov, 2011), the key areas of psycho-pedagogical support available to teachers (Podymova, 2012), mechanisms of teachers' motivation and professional self-determination (Alekseenkova, 2016; Pryazhnikov, 2012), complexes of diagnostic tools (Afanasyeva et al., 2016; Tyunnikov, 2016).

The framework and theoretical rationale of the above-mentioned continuing professional development aspects are derived from real innovative experience and are connected, in one way or another, with the goals of education modernization. Clearly enough, it would only be with reference to such projections, that we could contemplate the construction of a well-disposed system of professional development that would prepare teachers for innovative activities. However, there are questions to answer about the scope of practical objectives, the way they are clustered, and the criteria used.

Researchers studying various aspects of teacher training (designed for teachers-to-be, and for the already working ones), suggest certain clusters of objectives related to innovative activities (Ivanova, 2010; Lazarev, Martirosyan, 2006; Slastenin, Podymova, 1997 and others). As a rule, when designing a set of objectives, they put attributes of innovations at the forefront. In particular,

they highlight *functional orientation* and *stages of innovative activities*. Herewith, they refer teacher's objectives primarily to the teacher's project and experimental work (Afanasyeva, Novikova, 2016; Kharisova, Shukaeva, 2015 and others). Since such objectives have not been classified and are set forth as a list of random objectives, their logic suffers certain discontinuities.

Furthermore, not all of the above-mentioned objectives are articulated as objectives, since some of them fail to prescribe an activity leading to a specific desired effect, but, rather, they outline a direction of innovation ('participation in the design of future pedagogical system of an educational institution' (Ushakov et al., 2010), 'problem-oriented analysis' (Afanasyeva, Novikova, 2016; Dodueva, 2016). Moreover, objectives are different in scope, which encumbers their comparability. Some of them are so ambitious that instead of addressing a specific need, they target rather complex challenges ('to explore pedagogical innovations' (Afanasyeva, 2016, etc.), 'to identify and classify flawed (malfunctioning) pedagogical situations' (Slastenin, Podymova, 1997: 78). Some are part of a larger goal, such as 'to introduce innovations' (Slastenin, Podymova, 1997: 78), and for this reason, they lack autonomy.

One should also note, that any advancement of an educational system tends to affect different dimensions of the teaching and learning process and suggests a variety of innovative activities. The 'fan-like' scope of innovations covers different types of objectives that go beyond the mere conceptual design and experimental validation of the innovative processes.

In our view, it is hardly possible, if at all, to perform classification of practical objectives while relying solely on attributes of innovations. The reason for this limitation is associated not only with application of some discrete innovation attributes, such as the logic of conceptual design and experimental validation activities, etc.

In fact, certain difficulties arise due to the specific nature of practical objectives of innovative activities. Firstly, they act as the link between two fundamentally different realities – *the practice of the innovative transformation of the pedagogical system*, in other words, the practice of innovative processes, and *the practice of an innovative activity*. Secondly, they bridge these realities as the *goal* and *means* in a scope of diverse situations. In this connection, let us quote one of the definitions, interpreting an objective as 'the human mind's reflection of the relations between the goals and the specific situation' (Military pedagogy, 2008). Situations reveal various aspects of interaction of a teacher with the pedagogical system subject to modernization; situations help to specify the objectives, terms, and methods of their delivery.

This means that when classifying practical objectives, one needs to take into account not only some individual attributes of an innovative activity, but also the no less significant features of the process of the pedagogical system's innovative transformation.

In other words, classification of practical objectives needs a broader context, which would encounter their relevance to different realities and follow the principle of harmonizing necessity with sufficiency. Besides, it is important not only to suggest the unbiased rationale for classification, but also to link some meaningful attributes of the chosen rationale with the structure and content of the relevant criteria.

Therefore, the challenge of classification of innovation objectives is resolved through methodological substantiation of three quite distinct and yet interrelated procedures:

- identification of the rationale for classification;
- compilation of the classification criteria, taking into account classification of essential attributes of the rationale;
- clustering of the objectives of innovative activities by specific criteria.

Let us consider each procedure individually.

3. Results

The Rationale for Classification of Innovation Objectives.

The rationale for classification of objectives for an innovation activity is performed in the following logic:

- (1) identification of the rationale for classification;
- (3) ontologization of the rationale for classification.

As mentioned above, it is important to consider ontological aspects of practical objectives when performing classification. The 'hybrid' nature of innovation objectives – pertaining both to

the subject, and the object – makes one study the subject-object relations, when searching for a classification rationale. At present, the self-developing events, including general professional activities and practices, are described following the subject-object model, which allows to simulate the subject-object interaction in various modifications according to the changing needs of one's own self-development.

The subject-object relations (SO-Relations) make it possible to consider innovative activities as a holistic phenomenon, rationally depict the practical orientation and structure of the innovation process, to determine the functional status and roles of the teacher in this process. In our opinion, these very subject-object relations provide the objective rationale for classification of practical innovation objectives and for selection of the necessary criteria.

Ontologization of the classification rationale should start with an outline of the subject domain of innovation. Let us quote the following definition: "The subject domain is a part of the real world, viewed within a given context. Herewith, the context means, for example, an area of research, or an area that is an object of certain activities".

In our present outline, the subject domain is defined by means of description of properties and relationships of its object and subject.

The main object of an innovative pedagogical activity is the innovative pedagogical process. We proceed from the definition, according to which an innovative pedagogical process is a significant social shift in the quality of education through the development of existing innovations, as well as the development of professional competencies of the subjects of an innovative activity.

An innovative teaching process becomes the reference scenario of transformations, as it integrates all the key milestones of the educational system modernization. In relation to innovation, it appears in different plans and dimensions or, in other words, in different modalities. Obviously, the more completely and accurately we determine modalities of the innovation process, the more meaningful is the subject domain of innovations, and the wider is the reference base for classification of practical objectives.

However, it should be noted, that the choice of modalities to describe the subject domain of an innovative activity should not be haphazard. Some incorrect choice of modalities can lead to elimination of the innovative process as an autonomous integrity. The danger arises in case of excessive fragmentation of the innovative process, as well as in the case of its substitution with individual forms, that are hardly interrelated or do not have anything in common.

In this regard, one can legitimately raise the question about which modalities to prefer. Obviously, one should pay special attention to those modalities that, firstly, highlight the qualitative uniqueness of the innovative process in relation to the main vectors of innovative activity, and, secondly, feature continuity connections with other modalities in the general logic of the innovative process. Thirdly, they create the effect of replication, i.e. multiply and repeat the information in the course of transition from one modality to another.

Having said that, an innovative pedagogical process (IPP) should be described by the following mix of modalities:

IPP as a Project Vision. The project vision is the result of interpretation of the concepts and innovative development ideas of the educational system, from the perspective of socio-cultural strategy. In methodological terms, this means that innovation should be focused on predictive description of the innovative process, taking into account the main trends of the interaction of the society and culture, trends in the development of education, and the capacity of a particular educational organization.

IPP as a Project Design. In this case, the process of innovation takes the form of a project assignment to develop the system of project attributes and procedural attributes allowing to master innovation and to develop the pedagogical system on such grounds.

IPP as an Object of Experimental Validation Tests. The innovative process is presented in relation to innovation in the form of a modernized pedagogical system that needs to be validated for efficiency on the basis of tests in specially arranged conditions.

IPP as an Object of Professional Communication. In the context of this modality the innovative process performs the role of the main subject matter of professional communication in the pedagogical environment, including presentation, discussion, negotiation, coordination, peer review, mutual support.

IPP as a Management Object. The innovative pedagogical process is regarded from the standpoint of its planning, organization, coordination, control and regulation.

IPP as a Regulator of the Self-Directed Competence Development. In this case, the innovative process is related to the innovative activity in the reflective-evaluative terms and gains more importance as the catalyst of the teacher's aptitude to innovation.

Let us consider another characteristic of the subject domain, i.e. the subject of an innovative activity. Indeed, the subject domain of innovation can be most adequately understood if we consider the very innovative activity as a certain variable, in other words, as a set of emerging forms of subjectivity. Subjectivity is defined as a person's ability to be the agent (subject) of an action, to be independent from other people. Each individual subjectivity is characterized within an innovative activity not only by its functional roles, objectives and modes of action, but also by its specific object. Therefore, when analyzing innovative activities and while defining the subjectivity of a certain type, it is necessary to review the innovative process as an object of a particular modality.

In functional terms, one can specify at least six kinds of subjectivity manifested by a teacher who maintains different types of objectives in the course of an innovative activity: the pre-project subject, the project subject, the experiment subject, the communication subject, the management subject, the subject of self-directed competence development.

The Pre-Project Subject delivers its function in the formation of an innovative pedagogical process in socio-cultural and psycho-pedagogical perspectives as vision of the future. This innovative process is studied from the standpoint of social and cultural features of the reality, the state and social order, trends and resource capacity of the education development.

Functions of *the Project Subject* are set to design the project of an innovative pedagogical process or its integrated model in the landscape of new operating conditions.

The Experiment Subject is directly related to the development of experimental validation tests to assess the efficiency of the project development of the innovation process in the real world of education.

Activities of *the Communication Subject* are aimed at gaining understanding of the concept, objectives and challenges of the innovative process; optimization of conditions and forms of cooperation; generation of a positive and responsible attitude to the process and results of innovation.

The Management Subject realizes its function in handling objectives of organization, retention and development of the innovative process as a holistic phenomenon, according to its designed specifications, under given educational conditions.

The Self-Directed Competence Development Subject delivers the function of self-regulation of one's aptitude to innovations, as soon as it detects barriers to innovative activities that do not surrender to the available experience. Thus barriers become a starting point for reflection and external procedures related to professional self-learning and self-development. The subject's functions in this case are geared to assess one's own aptitude for innovation and foster the experience with new elements, so that in the long run an upgraded level of the aptitude for practical solutions is accomplished.

The classical and modern schools of Philosophy have set forth some principles that reveal the nature of the SO-Relations in cognition: activity of the cognition subject; the proxy links between the subject and the object; the sociocultural heteronomy of knowledge ([Philosophy, 2012](#)). These guiding principles deserve attention in research of the SO-Relations in a teacher's innovative activities. The main features of such SO-Relations include, first of all, the following attributes:

- functional integrity
- interrelation of the subject-object relations of different types
- unity and mutual transition of objectal and activity-related structures,
- spatial-temporal localization.

Functional Integrity means that the structural components of the system of SO-Relations are subject to the overall mission of education development involving some pedagogical innovation. This attribute indicates the need to consider SO-Relationship as a unity of three components: the subject of an innovative activity, the object of an innovative activity, and their interaction.

The innovation subject – Is a single teacher or a team of teachers, who deliberately set forth and deliver objectives of planning, organization and practical implementation of some activities designed to modernize the existing educational system. Any innovative activity is a subject-related factor, as it is indicative of the subject's ownership. Therefore, in a given system of relations, the subject (a teacher or a team of teachers) is identified primarily by the target, nature, and content of innovation.

In relation to the subject of an innovative activity, the object appears in the form of a holistic pedagogical innovation process. Hereby we proceed from the possibility and feasibility to present the innovative process as some set of specific modalities, which was shown in the description of the subject domain of a teacher's innovative activity.

Interaction between the object and the innovation subject, in its essence, is a functional relationship with a distinct practical orientation. To differentiate this functionality, it is important to detect some objective relations between the subject and the object within the system of SO-Relations.

Interrelations of Different Types of SO-Relations. An innovative activity is performed within some quite specific environment of SO-Relations that raise and resolve a number of very specific issues. In order to use the SO-Relations as a rationale for classification, they need to be considered as local systems of interconnected relationships of different types within the subject field of innovation.

In this case, the SO-Relations system is treated in a single analytical projection of the 'type of the innovation subjectivity - modality of the innovative process.' This allows to specify the functional features of the innovation subject while maintaining practical objectives of various types; as well as to establish the objectives' relation to an innovative pedagogical process of a particular modality.

Let us explain the above-said by an example. Efficiency of an innovative activity is much dependent on intensity of exchange of ideas, thoughts and experiences associated with the need to resolve some issues of education development. This exchange develops in various forms of discussion about principles, conditions and procedures of acquisition of pedagogical innovation. While organization and development of a directed discourse serve their objectives, the innovative process appears as an object of professional communication, i.e. with its particular structure and some meaningful content; in other words, in a specific modality. In this context, in our opinion, Innovative Management deserves special attention as an emerging independent discipline in science and education (Zhdankin, 2017). As you can see, this activity has its own subjectivity and its object for targeted actions.

Let us offer a brief outline of those activities that are integrated into the overall framework of innovation. Even at a glance one can register different impacts of different activities on the innovative transformation of educational practice. Such activities as the pre-project, project, experimental and management activities are of primary importance, as they directly influence the innovative reforms and their outcomes. In this sense, such activities as communication and self-development are merely indirect agents of transformation and can be qualified as secondary. However, secondary activities are interlinked with the primary basic ones. Thus, communication is developing amid some issues that arise and are discussed in the course of search for pedagogical innovations, development of innovative projects, organization and management of innovation, etc.

Unity and Mutual Transition of Object Structures and Activity Structures. The unity and mutual transition of object and activity structures within the SO-Relationship system means the actual opposition and interdependence of innovation and innovative pedagogical process as the product of this activity. To convert a pedagogical system, produce an innovative impact, generate and implement regulators and controls for their own innovations and aptitude to innovations, there should be not only the direct and inverse link between the subject and the object, but also the direct and inverse bond of the object with the subject. This gives rise to a situation where the teacher interacts not only with an educational innovation, but also with other elements of the innovative process, including that very innovation which is being designed, monitored and developed by the teacher. This opposition and interdependence is a condition for promotion of self-development of innovative educational practices and of self-development of its subjects.

Spatial-Temporal Localization. SO-Relationship - is a system of relations that create an inner framework of innovation, in which the subject and the object are with different degrees of detail localized 'on the site and at the time of activity'. The specifics of spatial-temporal localization of SO-Relations are mainly determined by the logic of innovation and the associated challenging aspects of the innovative pedagogical process. To address these very issues within the logic of innovation, the practical objectives are set, functions get updated and roles of teachers as agents of innovation are recognized.

These properties of SO-Relations indirectly yet mutually complement each other. Obviously, they should all be considered as basic requirements in detection and selection of Classification attributes, relevant to a particular criteria.

Classification Criteria for Innovation Objectives

The procedure for designing criteria follows a particular logic:

(1) definition of requirements needed for the selection of criteria for classification of innovation objectives;

(2) establishment of a framework for classification criteria.

The content of the criteria is determined by classification attributes of innovation objectives. It is clear that the classification criteria should somehow relate to the essential features of the SO-Relations. This can be achieved by translation of the essential features of the SO-Relations into the requirements to the selection of classification attributes of practical objectives (see [Table 1](#)).

Table 1. Harmonization of the Essential Attributes of the SO-Relations with the Requirements to the Selection of Practical Objectives' Classification Attributes

Essential attributes of the SO-Relations in innovations	Requirements to the selection of classification attributes
Functional integrity	Relevance of the classification attributes' interrelations
Interrelations of different types of SO-Relations	Congruence of classification attributes to the type of functional structures
Unity and mutual transition of object structures and activity structures	Compliance of classification attributes with practical situations
Spatial-temporal localization	Level-aligned classification attributes

The requirement of *Relevance of the Classification Attributes' Interrelations* means that their link to each criterion should be established on the basis of research of the three main categories: 'the subject of innovative activity' (innovation subject), 'the object of innovative activity' (innovation object), 'interaction between the subject and the object of the innovative activity' (interaction between innovation subject and object). With consideration of these categories, the overall structure of the classification criterion for innovation objectives looks as follows:

$$Cc = S(CA1):O(CA2):I(CA3).$$

The Classification Criterion (Cc), regardless of the level of classification, includes three structural components of SO-Relations: S – a teacher or a team of teachers as a innovation Subject; O – an innovative pedagogical process as an innovation Object; I – Interaction between the subject and the object of the innovative activity. Each structural component of the criterion is represented at a given level of the classification by a certain Classification Attribute (CA). For element 'S' it is CA1, for component 'O' – CA2, to component 'I' – CA3.

The requirement of *Congruence of Classification Attributes to the Type of Functional Structures* means that the selected attributes, by their range and content, should reflect the relationship between different kinds of subjectivity of innovation and their most typical modalities of the innovative process.

The requirement of *Compliance of Classification Attributes with Practical Situations* indicates the need to align the situation of the innovative process development with its analysis as an object of innovative activity.

Within the methodological framework of the subject-object approach, the classification can be made following the ‘Type-Kind’ principle, by two conjugated criteria: the criterion of Type-Value classification, and the criterion of the Kind-Value classification. Consequently, the first level classification attributes of innovation objectives shall prompt the standard Type-Value objectives, and the second level attributes prompt the Kind-Value objectives.

Let us outline the classification procedure.

Clustering of Innovation Objectives According to the Given Criteria

This procedure means:

(1) formation of a set of classification attributes of objectives within each criterion by defining attributes of SO-Relations;

(2) specification of the content of the classification attributes of objectives by labeling the structural components of SO-Relations.

(3) identification of homogeneous clusters by classification attributes within the specified criteria;

The first level classification, i.e. typology, of the innovation objectives is conducted by the Type-Value classification criterion. Classification attributes for this criterion are set within three structural components of SO-Relations as specified by the requirements (see [Table 1](#)).

In order to come up with the suitable classification attributes for such typology, one must conduct an inventory of level-specific values for practical objectives, i.e. determine what objectives may or may not fit into the Type category. For this very level of classification it is important to add weight to the attributes of structural components of the SO-Relations, so that they could approach certain upper limit values. When data is packed in such an intensive way, the peak value of such structural component as the ‘innovation subject’ corresponds to the classification attribute of the ‘kinds of innovation subjectivity’; the maximum value of such structural component as the ‘innovation object’ corresponds to the classification attribute of the ‘modality of innovative pedagogical process’; the maximum value of such structural component as the ‘interaction of the subject and innovation object’ refers to the classification attribute of the ‘dominant function of innovation’.

Thus, the Type-Value classification of objectives is defined by the classification triad of ‘the IA subjectivity type – IPP modality – the IA dominant function’. The labels applied to this triad allow to identify the following types of relationships:

<the Pre-Project subject – IPP as the project vision – the search function of IA>

<The project subject – IPP as the project development – the transforming function of IA>

<The experiment subject – IPP as the experimental validation object – the testing function of IA>

<The communication subject – IPP as the subject of professional communication – the conventional function of IA>

<The management subject – IPP as the Management Object – the organizational function of IA>

<The subject of self-development competences – IPP as a regulator of the self-development competences – the regulatory function of IA>.

As we can see, the standard SO-Relations, besides the project and experimental validation activities, feature other specific activities, as well as specific modalities of innovative pedagogical process and dominant functions.

* IPP – innovative pedagogical process, IA – innovative activity.

Given below is the list of types of innovation-related practical objectives related to the specified classification attributes (see [Table 2](#)).

The second level of the innovation objectives classification is relevant to the criterion of Type-Value classification that involves division of the previously identified types of objectives into smaller ones. Just like in the objectives typology, classification attributes within this criterion are chosen with respect to the structural components of the SO-Relations, according to the previously formulated requirements (see [Table 1](#)).

The level-aligned classification for each individual type of objectives is achieved, on the one hand, through identification of classification attributes that allow to benchmark the value of objectives of a certain type, and on the other hand, due to the meaningful description of

classification attributes by labeling the structural components of the SO-Relations in a given area of innovation.

Table 2. Classification of Practical Objectives of Innovative Activities by the Type-Value Classification Criterion

Classification attributes of practical objectives of innovations			Types of practical objectives of innovations
Type of subjectivity of innovation	Modality of innovative pedagogical process	Dominant features of innovative activities	
The pre-project subject	Innovative process as a project vision	Search function	Pre-project search objectives of IA
The project subject	Innovative process as a project	Transforming function	Project-transformational objectives of IA
The experiment subject	Innovative process as an experimental validation object	Testing function	Experimental validation objectives of IA
The communication subject	Innovative process as a subject of professional communication	Conventional function	Conventional communication objectives of IA
The management subject	Innovative Process as a management object	Organizational function	Managerial objectives of IA
The subject of self-directed competence development	Innovative Process as a regulator of competence development	Regulatory function	Competence-building and regulatory objectives of IA

As mentioned above, the objectives' values are defined within the upper and lower limit values of the SO-Relationship attributes. As the objectives' values are specified within limits set for each particular type, the values need to be enlarged by clustering an extended range of attributes of structural components of the SO-Relationship, that are subject to more detailed analysis within the classification of kinds. Concurrently the attributes need to gain the status of classification criteria allowing to register objectives with reference to the value of their final results, functional autonomy and operational perfection.

The transition of classification from the level of types to the level of kinds requires to specify the structural components of SO-Relations in more detail by adding some extra attributes:

attribute 'The Kind of Subjectivity of Innovation' is reduced to an attribute '*The Functional Role of the Innovation Subject*';

attribute 'Modality of Innovative Pedagogical Process' is reduced to an attribute '*Features of an Innovative Pedagogical Process*';

attribute 'Dominant Function of Innovation' is reduced to an attribute '*Practical Situation of an Innovative Activity*'.

Thus, we arrive at the triad of classification parameters, including 'Functional Role of the IA Subject –IPP Attribute – Practical Situation of IA' that define the type and value of innovation objectives.

Clustering of practical objectives within each type is carried out by labeling the SO-Relationships according to a predetermined triad of classification attributes. One should start with practical situations as they reveal the nature and content of the interaction between the subject and the object, and their composition and sequence correspond to the logic of the main activity stages (pre-project, project, experimental, and others.). With consideration of the content of practical situations, it is possible to identify the main functional roles of the teacher, and to determine the

most important characteristics of the innovative process. We will demonstrate how this is done with reference to each type of innovative objectives.

Pre-Project and Search Objectives of Innovative Activities. Differentiation of this type of objectives by their kinds begins with the layout of the structural component < Interaction between the Innovation Subject and the Innovation Object>. Labeling is performed on the basis of classification ‘Practical Situation of an Innovative Activity’ with regard to the main stages of the pre-project activity that allows one to select:

- the situation of Problems Detection in the Development of the Pedagogical System;
- the situation of Identification of Innovative Strategies;
- the situation of Expert Screening of Pedagogical Innovations;
- the situation of Forecasting the Development of the Pedagogical System.

Since each practical situation includes subjective and objective aspects, it becomes possible to perform a consistent labeling of the other two structural components of SO-Relations.

The label <Innovation Subject> is performed on the basis of the classification attribute ‘Functional Role of the Innovation Subject’ and is associated with manifestation of teachers’ functional roles that are typical for situations of pre-project activities:

- Analyst;
- Problem Detector;
- Strategy Setter;
- Expert;
- Forecaster.

The label <Innovation Object> on the basis of the classification attribute ‘Features of Innovative Pedagogical Process’ allows to register the attributes of the innovative process , which a teacher needs to apply when performing a pre-project activity to resolve some challenging situation. These important attributes of the innovation process include:

- Relation to IPP;
- Institutional IPP;
- Socio-Cultural Dynamics of the IPP;
- Eventfulness of the IPP;
- Factorial Determinism of the IPP.

Project Reform Objectives of Innovative Activities. Labeling of structural components of SO-Relationship is performed in a similar way. The label of structural component <Interaction between the Innovation Subject and the Innovation Object> is awarded on the basis of the classification attribute ‘Practical Situation of an Innovative Activity’ with regard to the main stages of the project activity that allows us to distinguish:

- situation of Problem Detection for the IPP;
- situation of Conceptualization for the IPP;
- situation of Modeling for the IPP;
- situation of Methodical Support for IPP.

The label of the structural component <Innovation Subject> is awarded on the basis of the classification attribute ‘Functional Role of the Innovation Subject’ and allows to differentiate functional roles of the teacher, which are common for a project activity:

- Problem Identifier;
- Concept Developer;
- Methodologist;
- Designer;
- Methodist (curriculum developer).

The label of the structural component <Innovation Object> is awarded on the basis of the classification attribute ‘Features of an Innovative Pedagogical Process’ and allows to establish a set of key characteristics of the innovative process, with which the teacher has to deal in different situations of the project:

- the System Integrity of the IPP;
- the Spatial-Temporal Development of the IPP;
- Integration of the IPP;
- Resource Capacity of the IPP;
- Operational Capacity IPP.

Experimental Validation Objectives of Innovation. The label of the structural component <Interaction between the Innovation Subject and the Innovation Object> in the framework of this type of practical objectives is awarded on the basis of the classification attribute 'Practical Situation of an Innovative Activity' with regard to the logic of the experimental stages of the activity. The results of this labeling are:

- The situation of Planning the Research And Experimental Validation of the IPP;
- The situation of Empirical-Experimental Validation of IPP;
- The situation of Processing of the Results.

The label of the structural component <Subject Innovation> is awarded on the basis of the classification attribute 'Functional Role of the Innovation Subject' which allows the teacher to identify the functional roles performed in experimental situations. Among the typical roles of the teacher are:

- Experiment Conductor;
- Diagnostician;
- Evidence Data Interpreter.

The label of the structural component <Innovation Object> is awarded on the basis of the classification attribute 'Features of an Innovative Pedagogical Process' and allows to highlight the key features of the innovative process , with which a teacher operates in the experimental activity:

- Changeability of Variables of the IPP;
- Specific Nature of Experimental Conditions;
- Validity of the Diagnostic Tools of the IPP Efficiency;
- Accuracy of the Experimental Validation Results.

Conventional Communication Objectives of Innovation. The label of the structural component <Interaction between the Innovation Subject and the Innovation Object> is awarded on the basis of the classification attribute 'Practical Situation of an Innovative Activity' and allows to specify, with regard to the logic of the communicative activity, the following situations:

- Situation of Business Communication;
- Situation of the Presentation of Pedagogical Innovations;
- Situation of Reasoning in Support of Some Innovative Opinion.

The label of the structural component <Innovation Subject> is awarded on the basis of the classification attribute 'Functional Role of the Innovation Subject", allowing to identify the most typical role of a teacher performed in communication situations:

- Presenter;
- Moderator;
- Sense-Maker;
- Critic;
- Expert;
- Consultant.

The label of the structural component <Innovation Object> is awarded on the basis of the classification attribute 'Features of an Innovative Pedagogical Process' allowing to highlight the characteristics of the innovative process , along with the most important ones in business communication situations related to efforts to resolve certain problems:

- Functions-And-Role-Specific Content of the IPP;
- Dispositional Discourse of the IPP;
- Conventionality of the IPP.

Managerial and Organizational Objectives of Innovation. The label of the structural component 'Interaction of the subject and the object of an innovative activity' is awarded on the basis of the classification attribute <Practical Situation of an Innovative Activity> and is based on the logic of management, allowing one to specify the following typical situations:

- the situation of Starting an Innovative Team;
- the situation of Organization of the Innovative Activity;
- the situation of Management of the Innovative Process .

The label of the structural component <Innovation Subject> is performed on the basis of the classification attribute 'Functional Role of the Innovation Subject' allowing one to identify the most typical role of a teacher performed in communication situations:

- Leader;

- Planner;
- Organizer;
- Coordinator;
- Controller;
- Motivator.

The label of the structural component <Innovation Object> is awarded on the basis of the Classification attributes ‘Features of an Innovative Pedagogical Process’ allowing to highlight the characteristics of the innovative process that are most important for management of different innovative situations involving efforts to resolve certain problems:

- Controllability of the IPP;
- Organization Structuring of IPP;
- Regulations for IPP;
- Functions-And-Role-Specific Coordination of the IPP;
- Functions-And-Role-Specific Motivation of the IPP.

Competence-Regulatory Objectives of Innovation. The label of the structural component < Interaction between the Innovation Subject and the Innovation Object> is awarded in the framework of this type of practical objectives on the basis of the classification attribute ‘Practical Situation of Innovative Activity’ with regard to the logic of competence-based self-regulation of aptitude for innovation. Such labeling allows differentiation of the following typical situations:

- situation of Self-Diagnosis of Aptitude to Innovations;
- situation of Self-Design of the Aptitude To Innovations;
- situation of the Professional Self-Directed Learning.

The label of the structural component ‘Innovation Subject’ is awarded on the basis of classification attribute “Functional Role of the Innovation Subject” and allows to identify specific functional roles that the teacher performs in situations of competence-based self-regulation of innovative activities:

- Self-Controller;
- Self-Designer;
- Self-Organizer;
- Autodidact.

The label of the structural component <Innovation Object> is awarded on the basis of the classification attribute ‘Features of an Innovative Pedagogical Process’ allows to identify the specific features of the innovative process that are the most important for competence self-regulation in innovative situations:

- Reflective Descriptiveness of the IPP;
- Professional and Personal Conditioning of the IPP.

Therefore, we arrive at a triad of classification attributes that are at the core of classification of Kinds of practical objectives of innovative activities. Herewith, it is important to observe the following requirements: clustering of objectives is possible only in case they are properly connected to each other and refer to a sequence of activities of a certain kind (pre-project, project, experimental, communicative, etc.).

Let us summarize the overall classification scheme for objectives pertaining to a teacher’s innovative activities.

Pre-Project Objectives of an Innovative Activity

- to identify the state order for education development;
- to define students’ educational needs;
- to analyze parents’ expectations for their kids’ education;
- to analyze development trends in a given field of education;
- to prioritize the innovative transformation of an educational organization;
- to analyze the socio-cultural situation from the standpoint of objectives of an educational organization’s innovative transformation;
- to select innovations in a given field of education;
- to assess opportunities for resourcing an educational organization’s innovative development;
- to forecast innovative development of an educational organization.

Transforming Project Objectives of an Innovative Activity

- to develop the conceptual design of the innovation process;
- to set goals of the innovation process;
- to design the content of the innovative process;
- to identify the logical and semantic structure of the process;
- to establish the relationship of the innovative process with other educational processes;
- to secure technological support to the innovative process;
- to develop tools to assess the innovative process efficiency.

Experimental Objectives of an Innovative Activity

• to develop a concept of empiric experimental validation of efficiency of the innovative process;

- to plan empiric experimental validation of the innovation process;
- to develop criteria and indicators of the efficiency of the innovative process;
- to develop diagnostic tools to assess the efficiency of the innovative process;
- to conduct the empiric experimental validation tests of the innovative process;
- to process the experimental data.

Conventional Communication Objectives of an Innovative Activity

- to identify the functions-and-role-specific profile of innovation;
- to conduct the joint assessment of the innovative project;
- to make a presentation of the innovation process;
- to conduct a joint discussion of challenges of the innovative process;
- to adopt collective decisions;
- to harmonize and coordinate innovative activities;
- to exchange experience of innovative activities;
- to mutually consult and interact in the process of innovation;
- to discuss the results of the innovative process;
- to virtualize interaction in the dynamics of the innovative process.

Managerial and Organizational Objectives of an Innovative Activity

- to plan the innovative process;
- to develop a management system for the innovative process;
- to organize the discussion of the innovative process;
- to allocate and distribute resources to innovation process;
- to organize collective innovative activities;
- to coordinate of innovation;
- to organize monitoring of the innovative process;
- to organize counseling in support of innovative activities;
- to assess results of the innovative process;
- to organize the discussion of the progress and results of IPP;
- to provide incentives and motivational support to innovations;
- to organize training of teachers to prepare them for innovative activities.

Competence-Related Regulatory Objectives of an Innovative Activity

• to identify one's own functions in the innovative development of an educational organization;

- to self-assess one's aptitude to innovations;
- to set goals of self-development of one's aptitude to innovations;
- to define the content of self-development of one's aptitude to innovations;
- to select methods of self-development of one's aptitude to innovations;
- to identify means of self-development of one's aptitude to innovations;
- to organize the process of self-development of one's aptitude to innovations;
- to self-monitor one's aptitude to innovations.

5. Conclusion

To sum up the mentioned above points, let us share our opinion of the proposed approach. In our view, implementation of the methodology of the subject-object approach to classification of the innovation-related practical objectives allows us to draw a distinction between different objectives, and to identify their clusters' specific attributes. In the meantime, the prospects of

creating a system of training teachers for innovative activities are gaining necessary prerequisites, including the updated educational objectives, educational content and didactic tools being adjusted to different stages of training and development. It is also important, that this approach does not mean to reject in any way other systems designs and other lists of innovation objectives, which have been proposed by other researchers. On the contrary, it is intended to complement them as an essential addition, provided that the classification rationale is well understood as the innovative activities' framework of subject-object relations meeting the requirements of integrity and completeness.

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References

- Afanasyeva, Novikova, 2016 – Afanasyeva, T.P., Novikova, G.P. (2016). The Modernization of Mechanisms of Innovative Activity of Preschool Educational Organizations. Monograph. Yaroslavl-Moscow.
- Afanasyeva, Novikova, 2016 – Afanasyeva, T.P., Novikova, G.P. (2016). Problem-Oriented Analysis of the Educational System at Pre-Schools. *Sovremennoe doshkol'noe obrazovanie. Teoriya i praktika*. 3: 20-35.
- Afanasyeva, 2016 – Afanasyeva, T.P., Yeliseyeva, I.A., Lazarev, V.S., Tyunnikov, Y.S. (2016). A Study of Differences in the Degree to which Instructors are Prepared to Manage the Development of the School They Teach at. *European Journal of Contemporary Education*. 17(3): 272-283.
- Alekseenkova, 2016 – Alekseenkova, E.G. (2016). Factors of Formation of Favorable Motivational Environment of Innovative Activity at School. Proceedings of the XI European Conference on Education and Applied Psychology (May 27, 2016). 'East West' Association for Advanced Studies and Higher Education GmbH. Vienna, 74-81.
- Dodueva, 2016 – Dodueva, S.Z. (2016). Problem-Oriented Analysis of the Environment of Preschool Educational Institution – The First Step Of Its Development. *Sovremennoe doshkol'noe obrazovanie. Teoriya i praktika*. 4: 34-42.
- Fedotova, 2013 – Fedotova, G.Y. (2013) The Commodity Nomenclature Of Foreign Economic Activity: Textbook. SPb.: Trinity Bridge, 2013.
- Ivanova, 2010 – Ivanova, Y.A. (2010). Pedagogical Problems as a Means of Preparing Future Teachers for Innovation. *Bulletin of the VSPU*. 1: 44-48.
- Kalygin, 2000 – Kalygin, V.G. (2000). Industrial Ecology. Lecture course. M.: MNEPU.
- Kazakov, 2011 – Kazakov, I.S. (2011). Design of a Personalized Model of High School Learning. *Yaroslavskii pedagogicheskii vestnik*. 3: 128-133.
- Kedrov, 1962 – Kedrov, B.L. (1962). Classification. Philosophical Encyclopedia. T. 2. M.
- Kharisova, Shukaeva, 2015 – Kharisova, L.A., Shukaeva, T.M. (2015). Innovative activity in Educational Institutions: Problems and Solutions. *Pedagogicheskoe obrazovanie i nauka*. 5: 14-17.
- Khutorsky, 2008 – Hutorsky, A.V. (2008). Educational Innovation: teaching aid. Moscow, Publishing Center 'Academy'.
- Kireyeva, 2006 – Kireeva, N.V. (2006). Approaches to the Explication of the Theoretical and Empirical Economic Analysis. *The economic analysis: theory and practice*. 2006. N 3.
- Kozhara, 1982 – Kozhara, V.L. (1982). Functions of the Classification. The theory of classification and analysis of data. Part I. Novosibirsk, 5.
- Lazarev, Martirosyan, 2006 – Lazarev, V.S. Martirosyan, B.P. (2006). Educational Innovation. Moscow.
- Lazarev, Stavrinoва, 2007 – Lazarev, V.S., Stavrinoва, N.N. (2007). Preparation of the Future Teachers to Research. Surgut: RIO SurGPU.
- Meyen, Schrader, 1976 – Meyen, S.V., Schrader, Y.A. (1976). Methodological Aspects of Classification Theory. *Voprosy filosofii*. 12: 67-79.
- Military Pedagogy, 2008 – Military Pedagogy (2008). Ed. O.Yu. Efremov, dictionary-reference book. St. Petersburg. [Electronic resource] <http://didacts.ru/dictionary/1056/word/zadacha>.

[Okhotskiy, 2008](#) – *Okhotskiy, E.V.* (2008). Public Administration in Modern Russia: Methodical Complex. M.: (University) of the MFA of Russia.

[Philosophy, 2012](#) – *Philosophy* (2012). Textbook. edit. V.P. Goryunov. SPb.: Publishing house of the Polytechnic University Press.

[Podymova, 2012](#) – *Podymova, H.P.* (2012). Psycho-Educational Innovation: the personal aspect. Monograph. M.: Prometheus.

[Pryazhnikov, 2012](#) – *Pryazhnikov, N.S.* (2012). Methods of activating professional and personal self-determination. M.

[Rozov, 1995](#) – *Rozov, M.A.* (1995). Classification and Theory as a Knowledge System. On the way to the theory of classification. Novosibirsk.

[Rozova, 1986](#) – *Rozova, S.S.* (1986). Classification Problem in Modern Science. Novosibirsk.

[Shkerina, 2009](#) – *Shkerina, L.V.* (2009). Development of innovative pedagogical Competence of Students of Pedagogical High School as the Factor of Professional Success. Materials of II All-Russia scientific-practical conference. 1. Krasnoyarsk: KSPU.

[Slastenin, Podymova, 1997](#) – *Slastenin, V.A., Podymova, L.S.* (1997). Pedagogy: innovation. M.: IPE “Masters Publishing House”.

[Subbotin, 2001](#) – *Subbotin, A.L.* (2001). Classification. M.

[Tyunnikov, 2013](#) – *Tyunnikov, Y.S.* (2013). Conceptual Positions and Principles of Classification of Additional Professional Education Programs (scenario approach). *Izvestiya Sochinskogo gosudarstvennogo universiteta*. 2: 143-149.

[Tyunnikov, 2013](#) – *Tyunnikov, Y.S.* (2013). Types of Additional Professional Education Programs (scenario approach): monograph. Sochi: OOO ‘Sterh’.

[Tyunnikov, 2014](#) – *Tyunnikov, Y.S.* (2014). Classification of Programs of Additional Professional Education at the Level of Types: The Methodology Of The Scenario Approach. *Izvestiya Sochinskogo gosudarstvennogo universiteta*. 2: 221-228.

[Tyunnikov, 2016](#) – *Tyunnikov, Y.S.* (2016). Interrelation of Evaluation and Self-Evaluation in The Diagnostic Procedures to Assess Teachers' Readiness Innovation. *European Journal of Contemporary Education*, 16(2): 248-256.

[Ushakov et al., 2010](#) – *Ushakov, V.A., Shamrai, N.N., Krasilnikov, A.A.* (2010). The Structure, Content and Characteristics of the innovative activity of the Teacher. *Problemy sovremennogo obrazovaniya*.

[Vayndorf-Sysoeva, 2009](#) – *Vayndorf-Sysoeva, M.E.* (2009). The Organization of A Virtual Learning Environment in Teacher Training to Innovate: Abstract. Dis. ... doc. ped. sciences. Moscow.

[Voronin, 1982](#) – *Voronin, Y.A.* (1982). Introduction to Classification. Novosibirsk.

[Zhdankin, 2017](#) – *Zhdankin, N.A.* (2017). Innovation Management M.: KnoRus.

[Zvyagintseva, 2009](#) – *Zvyagintseva, N.Y.* (2009). Formation of Innovative Competence of the Future Teacher. *Bulletin of the Adygeya State University. Series 3: Pedagogy and Psychology*. 4: 47-51.