



Quality Management of Pedagogical Research

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ABSTRACT

The relevance of the study is reasoned by the positioning of education as a public good and meaningful domain of personality. Socio-economic transformations of modern society affect different social institutions, including education, participating in the development of mechanisms for reproduction of social structure, the formation of socially and economically active individual, creating a competitive situation on the market of educational services and serving as a basis of human resources capital. It claims to improve the quality of educational research that has acquired an interdisciplinary character. The testing of the effectiveness of educational researches' results is carried out during the experimental work. The purpose of the article is to reveal the contents of experience-experimental work as the subject of quality management of pedagogical research. The leading approaches to the study are system approach that allows identifying of the types and functions of the experimental work and to establish relationships among them, and technological approach that allows developing of a program of experimental work. The paper defines the principles, clarifies the types, identifies functions and describes program and theoretical methods of the experimental work. Also it proposes classification of innovations in the educational system. The paper submissions can be useful for managers and teachers of educational institutions; employees of the centers of advanced training and retraining of personnel in the selection and structuring of the content for the training of scientific and pedagogical staff.

Keywords: The Quality of Pedagogical Research, Experimental Work, Education as a Publicly Significant Benefit

JEL Classifications: I21, I25, I28

1. INTRODUCTION

The relevance of the study is conditioned by the positioning of education as a public good and meaningful domain of personality. Socio-economic transformations of modern society affect different social institutions, including educational one, participating in mechanisms' development for reproduction of social structure, the formation of socially and economically active individual, creating a competitive situation on the market of educational services and serving as a basis of "human capital" (Lunev et al., 2014a). It demands the improvement of the quality of educational research in which the trend towards the integration of knowledge and complication of the structure of pedagogical science are marked (Kuznetsov, 2006).

It is found that integration, as one of the characteristics of knowledge, includes inter-disciplinarily, consistency, density (compactness), versatility (Babanskij, 1988). Taking into account that some characteristics, such as consistency, are independent characteristics of knowledge, it can be assumed that the integration of knowledge represents their comprehensive quality. Inter-disciplinarily implies the existence of meaningful relationships between integrated mono-disciplines. Feature of systematic knowledge, as a characteristic feature of the integration, is the presence at least of two levels: Consistency within each block of information and consistency within a particular module. Integration of knowledge involves the ability to perceive, remember and express information in compressed form. Modeling of such knowledge can only be achieved by combining of

information. An important feature of the integrative knowledge is their versatility, forming a perception of the world as a whole, in particular, synthesizing knowledge through the creation of private-scientific pictures of the world (Kara-Murza, 1981). Thus, integrative knowledge ensures the selection of the meaningful relations between concepts and theories. It is established that the development of research on problems of education on an integrative basis, in accordance with certain stages of society's activities, gives them the scientific integrity, consistency, increases the efficiency (Zagvyazinsky, 1997).

Examples of research on the base of the integration of pedagogical and sociological knowledge can be a model of education which is appropriate to the needs of society; asymmetry, dysfunction and imbalance in the staff training; the quality of specialists' vocational training and their competitiveness's level; incentives and motivation for vocational education getting for different social groups; regularities of interaction of education with civil society. Examples of studies on the base of the integration of pedagogical and economic knowledge are mechanisms of management, financing, autonomy of educational institutions; linkages between the labor market and the education market; property relations in the education system and several others.

Examples of research based on the integration of pedagogical and law knowledge can be normative-legal base of activities of educational systems; protecting of the rights of educational services' consumers; the competence and responsibility of all entities of legal relations in the sphere of education, etc.

It is established that the complication of the structure of pedagogical science, due to the integration of knowledge, allows allocating of relatively new components. For example, pedagogy of corporate education, studying peculiarities of staff's vocational training for chain's creation and new technologies' transfer; mechanisms for funds' attraction of potential employers and corporations in the system of vocational education (Lunev et al., 2014b). It is found that in conditions of pedagogical structure's complexity, it is important not to lose the subject of study, which leads to the formulation of goals, choice of problems and methods of experimental work (Burgin, 1989).

The experimental work is one of the subjects of quality management of pedagogical research. The purpose of the paper is to reveal the contents of experience-experimental work as the subject of quality management of pedagogical research. The condition to achieve the goal can be the following tasks' solving: To justify the organization of experimental work on the basis of system and process approaches; figure out the species, to define the principles, to identify functions, to describe the program and theoretical methods of the experimental work.

2. RESEARCH METHODOLOGY

The leading approaches to the study are a system approach that allows identifying of the types and functions of the experimental work and to establish relationships among them, and technological approach that allows developing of a program of experimental work.

A systematic approach leads to the definition of the system's structure-forming components, and the identification and assessment of the strong interdependences between these components. Using the systemic approach, the researcher studies in the structure of the system the relationship between structure-forming components, identifies trends and patterns of development. The technological approach on the basis of the specified initial settings (social order, educational orientations and the tasks of fundamental research) determines the structure of the experimental work: The subject, goal, objectives, stages and methods.

Technology and system approaches determine the organization of experimental work based on the following principles: Integration, separateness, networking, indicatively, transparency. The principle of integration involves the establishment of regular, stable relationships between participants of the experimental work based on a scientific analysis of the latest achievements of pedagogical theory and practice; formation of entity-entity relations on different levels of interaction. The principle of separateness ensures their equal cooperation and balance of interests, the emergence of goals and the non-additives of interest in accordance with the priority directions of state policy in the field of vocational education. The principle of networking is aimed at creating of models for testing of the results of research on structural and content updating of the education system on various logical grounds. The indicative principle determines the development of a methodology to determine the effectiveness of experimental work, monitoring of its results. The principle of transparency governs the conduct of experimental work and ensures targeting of the actions of the participants on the testing of research results.

In the process of the research a complex of methods was used: Theoretical (analysis, synthesis, generalization, classification), sociological (observation, survey, expert estimation).

3. RESULTS

It is established that experimental work is a form of interaction between research teams with educational institutions. The aim of the experimental work is the introduction and validation of fundamental research.

Experimental work as a form of interaction between research teams and institutions of education, performs the following functions: (1) Organizational and administrative, aimed at legal, financial and organizational support; (2) coordination that lead to the choice of methods and techniques of experimental work; (3) diagnostic, including development of test materials to identify the readiness of educational institutions to implement experimental activities in the selected direction, approbation of results of researches; (4) correction, manifested in the improvement of science teaching and learning materials for the implementation of the results; (5) prognostic, based on foresight methods - long-term prognostic studies that reveal the development of vectors of education, the models of future specialists' training.

In pedagogy there are different types of experimental work. (1) From the point of view of the depth of analysis of the problem

and the scale of coverage of the study course the experimental work can be: Descriptive, aiming at identifying of structure-forming components of the process and its dynamics; analytical, focused not only on identifying of structural components of the process and its dynamics, but also determining their regularities; diagnostic, aimed at solving of practical problems; modeling, associated with the hypothesis testing. (2) Being based on the amount of coverage of research entities, the experimental work can be continuous or selective. (3) from the point of view of comparative analysis, experimental work can be: Longitudinal, aimed at long-term study of the process or one of a group of people; cohort-oriented study of the entities of the same age for a long time; a panel held by a single program, on the same sample after a certain time interval; to provide monitoring, which can be defined as a constant observation of the process for quite a long time on the same metrics and methodology. These types of experimental work conducted in a single program, consistently at certain intervals of time, are designed to get the results that characterize the dynamics of changes of the research subject. (4) based on the location of the experimental work, it can be a field (natural) or laboratory one.

The program of experimental work in pedagogy includes: Object, subject, aim, hypothesis, objectives, outputs, methods, techniques, schedule, timeline and milestones, the agreement with the experimental platform, experimental platform passport, an analytical report, which presents the results of experimental work and theoretical justification, expert opinion, the acts of implementation, self-audit of experimental platform. It is necessary to consider the structural components of the program of experimental work in more detail.

1. The subject of experimental work is determined on the basis of the results of fundamental research. In modern conditions, when “human capital” becomes a major resource of social development, the value of the human Sciences is increased. Improving of the theoretical level and the determination of the status of pedagogy as the only special science about the education, the increasing of the role of interdisciplinary research in education led to the development of new paradigms of pedagogy: Cognitive-informational, personal, culture-logical and competence. In modern conditions the priority directions of fundamental research in education are: Personalized learning models; the forms and methods of integration of training and education; comprehensive (informational, psychological, methodological and other) ensuring of educational process.
2. The choice of subject determines the wording of the topic of the experimental work. In the formulation of the topic its relevance, the relevance for the fundamental research, the opportunities of material and technical base of experimental fields, teaching experience of the participants of the experimental work should be taken into account. The theme of the experimental work should reflect its essence and so be precise and clear.
3. On the basis of subject matter and topics the aim is determined and the hypothesis is built. An important component in determining of the objectives is the analysis of legal acts and publications on the topic of experimental work. Purpose, theme and subject of the experimental work dialectically are

interrelated and reflect its essence. Purpose and hypothesis determine the choice of experimental and control objects of the experimental work, as well as evaluation of criteria of the expected results and participants of the experimental work.

4. Objectives of the experimental work (to study, determine, develop, identify, clarify, classify, create, disclose, justify, describe) specify objective and ensure its successful accomplishment.
5. Output is the forms of implementation of the results into practice (scientifically-methodical recommendations, manuals, methodical recommendations, papers, etc.
6. Under methods are understood the ways of study of pedagogical processes, obtaining of scientific information about them in order establish regular connections and build scientific theories. Methods of experimental work can be classified into theoretical, empirical, non-parametric and mathematical ones. Method is specified in the research techniques which contain the description of the subject and procedures of the study, methods of fixation and processing of the obtained data. On the basis of a method many techniques can be created.
7. Scheduling, which includes the system of measures for the implementation of tasks with deadlines, responsible executors, required material, technical, organizational and scientific-methodological support.
8. Dates of experimental work determine its beginning and end and depend on the goal. The stages of experimental work determine the sequence of problems’ solving within set deadlines. Most often the following stages are allocated: (1) Organizational, which is characterized by: The definition of the subject, the conclusion of the agreement with the experimental platform, program development (goal setting, construction of hypotheses, specification of objectives, definition of outputs and the choice of methods and techniques), preparation of passports of the experimental platform and CVS of team members (gender, age, teaching experience and work experience in the institution acting as experimental platform; publications confirming their willingness to carry out experimental activities on the chosen topic; the definition of authority), creation of conditions (material, technical, personnel, scientific-methodological, organizational) to conduct experimental work; conducting of a pilot (exploratory, pilot) research (“survey”) to clarify the subject, objectives, hypotheses, tasks, methods, techniques, program, by interview, the expert survey; (2) a creative and transformative, in which: Schedule is prepared, methods are developed, the program is implemented, current results are tracked; (3) the synthesis focused on: Control sections and processing of data, correlation of results with the aim, hypothesis and objectives, preparation of a case report, which presents the results and their theoretical justification, preparation of expert opinions, preparation of output products, conducting by experimental platform of a self-audit.
9. The expert determination is based on the case of documents about experimental work: The experimental platform’s passport and resume of the team members of the experimental work; calendar plan; techniques; analytical report, which presents the results and their theoretical rationale; output

products; the results of self-audit of experimental platform; acts of implementation. The expert report represents a detailed review, including the characteristic of positive aspects; rationale of comments; proposals on optimization of the experimental work. Expert opinion is made by expert Council, which includes representatives of research group (as part of the fundamental research of which the experimental work was carried out), the head of the experimental platform, a scientist - a specialist on the problem of experimental work. To start experimental work means to develop a program of experimental work, to conclude the agreement with the experimental platform, to make the passport of experimental platform, CV of the team members of the experimental work. To close experimental work means to present implementing acts, the act of self-audit of experimental platform, prepare the analytical report on the results of the experimental work and their theoretical justification, to obtain an expert opinion.

It is found that the set theoretical methods of the experimental work consists of logical methods, modeling, foresight method, integrative-contextual methods, study of the best teaching practices, action research (AR), case study method.

Logical methods represent logical inferences - complex cognitive activities involving abstraction, analysis, synthesis, comparison, deduction, induction, generalization, concretization, systematization and formalization. For example, the essence of abstraction consists in one or more of the parties' allocation of the experimental subject. Content analysis is a set of techniques and patterns of decomposition of the experimental subject into its component parts, while synthesis is the set of techniques and patterns of the individual parts' connection of the subject into a coherent whole. Deduction is logical inference in which the conclusion is reached based on knowledge of common properties of the majority. Induction - reasoning from the particular to the General. Under the formalization is understood a method of objects' studying by mapping of the content and structure in symbolic form. Comparison - finding of similarities and differences of objects and processes on one or more grounds. Measurement - a procedure for determining of numerical values of some quantity.

Simulation methods include the design, simulation, planning, foresight, forecasting and designing. The design aims to create models of planned (future) processes and phenomena (in contrast to simulation, which may be spread and on the last experience with a view of its deeper understanding). A model is an artificially created object in the form of a diagram, which, being like a specimen, and displays and reproduces in a simpler form the structure, properties, interconnections and relations between its elements. Planning - scientifically and practically-based definition of goals, identifying of tasks, timelines, rates and proportions of development of a phenomenon, its realization and implementation in the public interest. Foresight in the narrow sense is a prediction, in wider - preferred knowledge of events or phenomena that exist but are not recorded in the present experience. Forecasting is a form of foresight, which is expressed in the goal-setting, programming and management of planning process based on

identified parameters of its creation, existence, sustainable forms and development trends. Designing is intellectual activities, which consist in the purposeful construction in the ideal shape of any object that is not a deliberate reproduction of another object.

Foresight allows on the basis of expert estimations to compare long-term forecasts and strategies for the development of education for the most complete comprehensive vision of the future and agreement on how to achieve it. Foresight is focused not only on the identification of possible alternatives, but also on the choice of the most preferred ones. Foresight methods are not only focused on the obtaining of new knowledge in the form of reports, a set of scenarios, recommendations, etc. An important result is the development of informal relationships between participants, the creation of a unified picture of the situation. Qualitative difference of the foresight method is that the broad number of experts are attracted representing various areas of activities in order, first, to take into account all possible options, to anticipate the most unexpected ways of development and to obtain a comprehensive assessment of the predictable process; secondly, to choose the most optimal variants of innovative development and to develop a program to achieve them.

The collection of contextual integrative methods includes the historical, logical, axiomatic methods and content analysis. The historical and logical methods are closely interrelated. The essence of the historical method is that in all its multifaceted nature the history of the object is reproduced of the studied object. When a logical method it is distracted from all the historical accidents, the most important and significant is singled out. The historical and logical methods complement each other. Under the axiomatic method of constructing of a scientific theory, a number of claims are accepted without proof, and all other knowledge are derived from them according to certain logical rules. Content analysis is quantitative analysis of texts for subsequent meaningful interpretation of the identified numerical regularities.

The advanced pedagogical experience includes innovative pedagogical activities. When selecting the criteria for classification of innovation in the education system it is necessary to follow the following requirements: A complex set of classification criteria which are to be taken into account; the possibility of quantitative (qualitative) definition of criterion; scientific novelty and practical value of the proposed classification feature. Taking into account the above mentioned requirements to the criteria of innovations' classification, it is offered to group innovations in the education system on the following grounds: (1) The scope of application of innovations (new for educational system in the country, region, educational institutions); (2) the degree of complexity of innovation: (Private, unrelated with each other, modular, representing a complex of private innovations, system, covering all the institutions); (3) kind of effect resulting from the introduction of innovation (scientific, technical, social, environmental, economic, integrated, incorporating all previous ones); (4) form of innovations (discoveries, inventions, patents, original educational services; technology, methods, forms, means of organization of the educational process; symbols of the educational institution (flag, anthem, emblem), audio and

video recording, the green zone; new documents, describing the technological, educational and managerial processes; new structures; psychological and pedagogical conditions for optimization of life activities of the educational institution); (5) field of application (control; learning process; the process of education, physical infrastructure, staff); (6) innovative potential (modification innovations, associated with the improvement, rationalization of that which has an analog or a prototype; combinatorial, i.e., new constructive combination of elements of prior art techniques, technologies; radical, that is, not having analogue); (7) innovations' relation to predecessors (replacement ones that is entered instead of a particular legacy instrument; canceling, meaning the termination of activities of some structures; opening, offering development of something new; retro introduction, i.e. the development of a new for this educational institution, but already used for educational or managerial practice); (8) innovations related to changes in the status of the educational institution (the change of the legal form, change of the form or the type of educational institution); (9) innovations, which differ in the level of funding (federal, regional, self-financing). It was found that the main forms of studying of advanced pedagogical experience include: Open classes, conferences, teaching readings, educational exhibitions, discussions, seminars. Analytical information on good pedagogical experience includes: Relevance and analysis of educational tasks; information about the author; conditions of formation of experience; content; novelty and perspectives; effectiveness.

The study and use of advanced pedagogical experience is interconnected with AR. It is a modern method that includes, as the scientific knowledge and the active intervention (modification, transformation, improvement) in the object of study. In teaching practice, the term "AR" was introduced by Stephen Curry in 1949. Although he did not connect AR with fundamental science, considered this method an effective way to solve practical problems, with his light hand it came into the use as the concept of "teacher-as-researcher." It could better describe the specifics of innovative labor of teacher, constantly experimenting with new material which was in an active search (Dobrenkov and Kravchenko, 2004). The most important part of the AR is a principle of social intervention. The researcher is permitted to interfere in the process of observation (study), to be converted into its active participant, change the direction of events, use their judgment when interpreting, the assessment of scientific results (use the observed experience). The AR scientist acts as a third-party expert (consultant), the purpose of which is to interest the practitioners of a scientific problem, get their help, collect information and test results of fundamental research. The problem is defined in the dialogue process between the researcher and practitioner on reaching mutual understanding of them. The expert is included in the dialogue, promoting active cooperation of participants and their self-reflection.

Features of case method consist in the fact that it includes analytical procedures; serves as a means of collective learning, the most important components of which - the work of the group and sub-groups, the exchange of information; it is the process of formation of an information field.

4. DISCUSSIONS

The issues on the organization of scientific research are the subject of monographs and papers by Kuznetsov (2006), Kara-Murza (1981), Novikov and Novikov (2009), Gerasimov (1985). The monographic study of Novikov and Novikov (2009) informs that experimental work is one of the features of any scientific research. In the book of Gerasimov (1985) it is emphasized that in the course of development of science means of knowledge are developed and improved, one of which - an experiment. Features of the organization of educational research are disclosed in publications of Babansky (1988), Zagvyazinsky (1997), Burgin (1989), Bryzgalova (2003). However, kinds, principles, functions, program of experimental work are the subject of scientific debate. Theoretical methods of experimental work need systematization too.

5. CONCLUSION AND RECOMMENDATIONS

The content of the experimental work as a subject of educational research's quality management is conditioned by system and technological approaches, which allow allocating of species, to identify principles, to reveal the functions, to describe the program and theoretical methods of experimental work. Kinds of experimental work are clarified: Descriptive, analytical, modeling, continuous, selective, longitudinal, cohort, panel, monitoring, field and laboratory. Principles of experimental work are defined: Integration, separateness, networking, indicative and transparency. Features of experimental work are revealed: Organizational, administrative, coordination, diagnostic, remedial and predictive. A program of experimental work is described, including the subject, topic, purpose, hypothesis, objectives, outputs, methods, techniques, schedule, timing and stages, a contract with an experimental platform, experimental platform's passport, analytical report, which presents the results and their theoretical justification, experts' opinion, implementation of acts, self-audit of experimental platform. Theoretical methods of experimental work are described and classified: Logical methods, modeling techniques, Foresight method, integrative and contextual techniques, the method of studying of the advanced pedagogical experience, AR, case method. The classification of innovations in the education system is proposed on the following grounds: The scope of application of innovations; the degree of complexity of innovation; kind of effect resulting from implementation of innovations; form of innovation; application area; innovative potential; relation to innovation's predecessors; innovations related to changes in the status of the educational institution; innovations, which differ in the level of funding.

It is found that the organization of experimental work on the basis of the above mentioned provisions leads to the quality of educational research and the efficiency of specific executors. Therefore, one of the characteristics of quality management of educational research is to organize experimental work based on the results of basic research. This will improve the image of the teaching science and its relevance.

Taking into account the results a number of scientific issues on quality management of educational research that require further consideration can be identified: To develop an algorithm for evaluating of the performance of research groups; summarize empirical and nonparametric methods of experimental work; justify the application of methods of mathematical statistics in pedagogical research.

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