

Designing the individual educational path for professional development of teachers

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Abstract. Search of effective forms of professional development for teachers of educational institutions is a dominant factor of education development. Therefore, attention of the Russian educational community is focused on developing the professional competence systems for teachers based on the reliable diagnostic tools. In this context designing the individual educational path for a teacher allowing to implement the right to choose the own educational path in professional development is of particular importance. This article presents an algorithm for designing the individual educational path in professional development and diagnostic tools to assess the level of the design competence of a teacher in the area of design activities under the conditions of the information educational environment. The diagnostic tools for assessing the level of the design competence of a teacher is especially important at this stage which includes developing components: the cognitive one, the operational and technological one and the creative one. These tools have been developed using modern methods of the psycho-pedagogical research: questionnaires, control tasks and tests.

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Introduction

Entry of Russian education into a single European educational system has set new tasks for the state one of which is creating a professional development system for a teacher within which he will be able to choose individual educational paths [1] in accordance with own needs and peculiarities of personal development which allows to develop as long as life endures [2]. It is not by accident that in the research we have given special consideration to development of design competence of a teacher as this competence is leading and predetermining the efficiency of other professional competences. At the same time this kind of competence “is responsible” for development of the ability to design the content and form of future diversified activities [3] and presents means of “intensification and optimization of the educational and self-educational process” [4] in terms of the changing and developing information educational environment. This is facilitated by fast development and implementation of remote and information and communication technologies and methods of using special digital educational resources (educational electronic study guides and publications, computer-based teaching systems, multimedia audio- and video educational resources etc.) [5,6] in the educational process.

Methodology

We have developed the algorithm for designing the individual educational path which

consists in determining organizational and procedural actions relating to choosing the modules which in their turn take into account individual needs, creative self-development [7], professional difficulties and teaching experience. The algorithm for designing the individual educational path includes objectives and tasks for stepwise organization of continuous professional development of the teaching staff based on the individual plan of implementation of further professional education programs (Fig. 1).

For effective implementation of the developed algorithm it is important to take into account a number of principles (broad participation of the leading educational staff, individualization, dialogueness [8] of integrity of professional development programs, continuity, territorial distribution) (designing the professional development process for teachers under the conditions of the information educational environment (through the example of the Volga Region Center for Further Training and Professional Retraining of the Kazan (Volga Region) Federal University).

Relying on design, competence, system and activity and person-centered approaches allows to develop the design competence of teachers as an effectively targeted basis for professional development containing relevant components (cognitive, operational and technological and creative) and consisting of a set of competences of teachers

according to the objects, tasks and types of their professional activities (Fig.2).

The design competence does not appear of nowhere in the process of a teacher professional activity. It should be created and developed in the special educational environment.

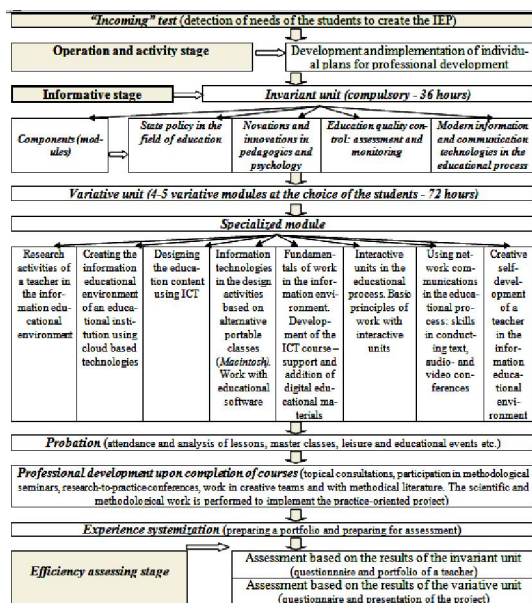


Fig. 1 The algorithm for designing the individual educational path for professional development of teachers under the conditions of the information educational environment

This type of teacher competence is an interrelated set of knowledge of the essence and technology in designing the educational process, the system of professional design skills, knowledge and integrative properties of a person with certain intellectual, activity and value and motivational properties as well as ability and readiness to design its own personal development. Interaction of these qualities of a teacher provides an opportunity to choose educational modules required to make an individual plan for taking educational programs.

DESIGN TEACHER COMPETENCE STRUCTURE			
Components	Cognitive component – knowledge of basic design concepts and principles, forecasting possible obstacles and possibilities, elimination, analyzing the results of own actions	Operational and technological component – possessing relevant skills and knowledge in using the design algorithm to increase the productive activity and to increase own opportunities	Creative component – possessing general intellectual abilities and creative qualities, readiness to produce new ideas and to make decisions, thirst for innovative knowledge and its usage in the area of distance education
	Information and self-education: I.s.e.-1; I.s.e.-2; I.s.e.-3; I.s.e.-4; I.s.e.-5	Functional and methodological: F.m.- 1; F.m.- 2; F.m.- 3; F.m.-4	Constructive and creative: C.c.-1; C.c.- 2
Set of competences	Socio-pedagogical: S.p.-1; S.p.-2; S.p.-3; S.p.-4; S.p.-5	Diagnostic and consultative: D.c.-1; D.c.-2; D.c.-3; D.c.-4	Research: R.-1; R.-2 Forecasting: Fc.-1; Fc.-2

Fig. 2. Design teacher competence structure

We have developed the design teacher competence structure that corresponds to the tasks, structure and content of the information educational environment in the professional development system for teachers. It involves development of a set of professional competences information and self-education, socio-pedagogical, functional and methodological, diagnostic and consultative, constructive and creative, research and forecasting) [9].

Main part

In conditions of the Volga Region Center for Further Training and Professional Retraining of the Kazan (Volga Region) Federal University we have developed and tested the experimental diagnostic tools to assess the levels of developed design competences of a teacher under the conditions of the information educational environment in the process of professional development of teachers. The experiment proved the assumption made that traditional professional development of teachers contributes little to creative development and self-development of teachers and especially to development of their design competence which is one of the basic skills of a teacher on development of which the professional teacher development system should be focused at the modern stage. This is proved by the diagnostics of teachers conducted which is based on determining the level of design competence developed including: questionnaires, control tasks and creativity tests (see Table 1).

During the organizational and procedural actions the teacher (hereinafter the student) enrolled in professional development courses is offered the algorithm including the incoming test and 3 stages of designing the individual educational path [10]: operation and activity, informative and efficiency assessing.

1. **“Incoming” test** (detecting the needs of students).
2. **The operation and activity stage:** development and implementation of individual plans for professional development.
3. **The informative stage:** choosing the modules taking into account their further implementation (the invariant one and four variative ones (specialized, probation, professional development upon completion of courses and experience systematization)).
4. **The efficiency assessing stage:** assessment based on the results of the invariant unit (questionnaire and portfolio of a teacher); assessment based on the results of the variative unit (questionnaire and presentation of the project).

Table 1 Diagnostic tools to assess the levels of developed design competences of a teacher

	Competence content	Characteristics
	COGNITIVE COMPONENT	
	<p>Information and self-education:</p> <ul style="list-style-type: none"> - possessing the information culture, ability to set objectives; to summarize, to analyze and to acquire information (I.s.e.-1); - knowledge of basic definitions of the information technology and ICT (I.s.e.-2); - capacity for cognitive activity (I.s.e.-3); - ability to logically build oral and written speech (I.s.e.-4); - readiness for practical analysis of the logics of different reasoning, possessing skills of public speech, argumentation, holding a discussion and disputes (I.s.e.-5). 	The developed level is characterized by theoretical training in the sphere of ICT and its usage in the professional teaching activities.
	<p>Socio-pedagogical:</p> <ul style="list-style-type: none"> - ability to understand the essence and value of information in development of the modern information society, realize risks and threats arising in this process (S.p.-1); - ability to bear responsibility for the results of the own professional activities (S.p.-2); - to realize social significance of the profession when performing professional activities (S.p.-3); - readiness to analyze the information to solve problems arising in the professional teaching activities (S.p.-4); - ability to predict the results of the professional teaching activities (S.p.-5). 	The level of the developed cognitive component is determined through the test containing theoretical questions with the variants of answers and analysis of the questionnaire data.
	OPERATIONAL AND TECHNOLOGICAL COMPONENT	
	<p>Functional and methodological:</p> <ul style="list-style-type: none"> - readiness to organize the scientific-methodological activities: seminars, trainings, conferences and scientific groups to study distance education technologies (F.m.- 1); - ability to adopt and implement the methodological content of using the information educational environment into practice of the teaching activities in the educational process (F.m.- 2); - readiness to use basic methods, ways and means to obtain, store and process information, to work with a computer as means of information management (F.m.- 3). - ability to acquire and use new knowledge using modern educational and information technologies (F.m.- 4). <p>Diagnostic and consultative:</p> <ul style="list-style-type: none"> - ability to work with information in global communication networks (D.c.-1); - ability to find, systematize and analyze information in terms of its abundance and excess (D.c.-2); - work with databases in a user mode; - provide consultations to organize midterm examination in a group (D.c.-3). 	The level of the component development is determined using an expert assessment of the results of performing different practical tasks. To assess component development at the summative stage of the experiment a set of professionally-oriented tasks has been developed.
	CREATIVE COMPONENT	
	<p>Constructive and creative:</p> <ul style="list-style-type: none"> - possessing the creative process (searching ideas and information, reflection and modeling) (C.c.-1); - readiness for independent creative activity and assimilation of information (C.c.-1); <p>Research:</p> <ul style="list-style-type: none"> - readiness to use known tools in non-standard conditions and not for its intended purpose (R.-1); - ability to reveal the scientific-methodological sense in the phenomena and processes under consideration (R.-2). <p>Forecasting:</p> <ul style="list-style-type: none"> - ability to assess resources and opportunities and to adjust goals with the action plan (Fc.-1); - readiness to analyze possible consequences of intended actions and to prepare for their implementation (Fc.-2). 	To diagnose the level of the developed creative component we have used the adapted modification of the personal creativity test by Williams, the Johnson's creativity questionnaire, the assessment test to determine the creativity level

When the student of professional development courses had undergone all the stages suggested it became possible to track the dynamics of relevant components of design competence and to assess the levels of their development in general

among respondents at the beginning and at the end of the experiment

The positive dynamics of design competence development among teachers of the experimental group is observed by the following components: the cognitive one - by 15% and the operational and

technological - by 33 % (Fig.3) which proves the efficiency of professional development of a teacher based on the developed algorithm of designing the individual educational path of professional development of teachers under the conditions of the information educational environment.

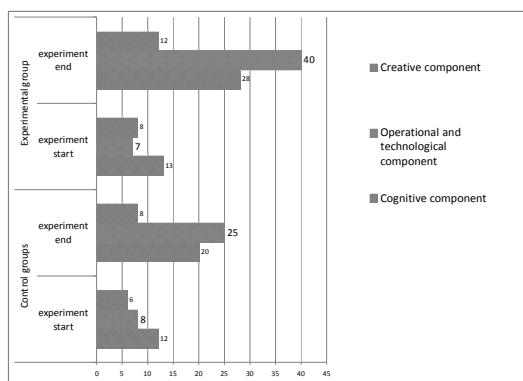


Fig. 3. Average value of development of the components comprising the design competence of a teacher (in %)

As seen from the results of the research the comparative analysis of data of the summative and formative assessment showed positive dynamics of key indicators of development of the design competence of a teacher through designing the individual educational path in the process of professional development (see Table 2).

Table 2. Dynamics of development of teacher design competence

	Initial level %	Level of proficiency%
Control group	16	24
Experimental group	16	43

Conclusion

In development of the design competence of a teacher the information educational environment of the professional development system for teachers is of special significance which allows to maximally effectively use the means of modular education and remote forms and methods, first of all, implemented on the interactive basis. Teaching self-reflection methods for the students based on the diagnostic tools becomes the main condition to build and develop this type of competence among teachers.

The results of the research conducted allow to make the following **conclusions**:

1. The relevant and prospective line for development of modern professional development systems for teachers is the technique for designing the individual educational path aimed at their

education which suggests the right of a teacher to choose innovative forms, methods, ways and means of development of modern information and communication technologies which is maximum effectively provided by the information educational environment.

2. The developed algorithm of designing the individual educational path of professional development of teachers under the conditions of the information educational environment which is the methodological landmark in determining the tasks and objectives of stepwise organization of continuous professional development of teachers based on the individual plan of course training (including the invariant and variative units) as well as in choosing the technique for its implementation through most educational professional development programs with balanced distribution of the study time and including different educational forms (including innovative).

3. The structure of the teacher design competence as the effectively targeted basis for professional development consists of the following components: cognitive, operational and technological and creative and allows the teachers choosing necessary competences (information and self-education, socio-pedagogical, functional and methodological, diagnostic and consultative, constructive and creative, research and forecasting) in accordance with the objects, tasks and types of their professional activities.

It is necessary to highlight the developed and tested diagnostic tools for assessing the levels of development of the teacher design competence under the conditions of the information educational environment (cognitive, operational and technological and creative) which allowed to identify that participation of teachers in development of own individual paths of professional development significantly increases efficiency of professional development courses.

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