V International Forum on Teacher Education

The Formation of Foresight Competence as a Factor in Improving the Quality of Teacher Training

Aleksey N. Panfilov* (a), Valentina M. Panfilova (b)

(a) Kazan Federal University, 420008, Kazan (Russia), 18 Kremlyovskaya street

Abstract

The article deals with the problem of forming the ability of a student teacher to foresee and shape his or her pedagogical career, providing not only short-term goals, but also a foresight in pedagogical activity. The relevance of the research is caused by the fact that it is necessary to form new teacher competencies demanded by educational transformations, which leads to a change in the content of the subject, psychological, educational and methodological training of future teachers. The novelty of the research is seen in the fact that the wording of new teacher competence is proposed: foresight competency as an integrative multi-level personality-professional education, which determines the students' ability and readiness to predict their professional future as a research-reflexive activity to transform their own professional activities. The purpose of the article is to present a structurally functional model of the development of prospective teachers' foresight competence and the results of the experimental work. The experimental work on the deployment of a foresight competency model in the process of studying modules of the educational program (basic and variable), on modeling the subject and social content of future professional activity is described. It is proved that by means of adequate pedagogical technology in educational modules the development from competencies provided by the basic professional educational program to professionally focused meta-competence, foresight competence, is achieved.

Keywords: foresight; foresight competence; structurally functional model of competence development.

* Corresponding author. *E-mail address*: *panfiloval@mail.ru*

Introduction

The relevance of the problem

The modern world is under the conditions of global technological advancements and digitalization, which in turn requires the development of new didactics of teacher education and new didactics of the educational process at school.

In the era of radical changes, the role of teachers is significantly increasing in education. They not only transfer modern knowledge, but also create new pedagogical ideas and educational processes for the future. What is important in this process is a student's ability to master a teaching profession, anticipate and shape his/her teaching career achieving not only short-term goals, but also foresight in teaching activity. Of course, this is a debatable question, but taking into consideration technological, economic and social changes which are taking place in the Russian society and the new state order in the field of education, it is necessary to consider all factors affecting education, and especially pay attention to the work with the future (Dibrova, 2014; Obushchenko, 2007).

Modern tendencies

The term "foresight" has begun to be actively used since the end of 1980s of the last century. This term means not only the study of the future, but also a set of approaches to decision-making in order to improve the factors affecting the future in the long term. It is an attempt to get a glimpse of the future of professional activity in order to assess the major directions of own professional achievements.

Foresight is a systematic reflection on the future and the impact on the future (Asadullin & Tukhvatullin, 2014; Evzrezov & Maier, 2014; Kryukov, 2010). Foresight is not future planning, not formal forecasting, it is what combines all these elements. Most attention is paid to three completely dissimilar things. First, it is a prediction of the future as a normal research-reflexive activity and clearly refers to cognition. Second, forecasts should be linked to the activities of those who make decisions and build the future. Third, "I want not only predict the future, but also make it. To change the world on the basis of my ideas, so that it would become better than today, at least from my personal point of view" (Pereslegin, 2009; Rapid Foresight Methodology, 2015).

Specifying teacher competencies in the context of educational transformations is the most important task, the solution of which will determine the content of the subject, psychological, pedagogical and methodological preparation of future teachers. In the study, we relied on the understanding of the teacher's foresight competencies proposed by Akhtarieva (2016, 2017). The foresight of teacher competencies is the development and implementation of practical measures for the development of teacher competencies aimed at meeting the perspective (demanded in the future) educational needs of the individual, family and society, based on the systematic assessment of the long-term prospects of educational technologies (Akhtarieva & Sharipova, 2016; Akhtarieva & Sharipova, 2017).

The basis of the study

Unlike the traditional pedagogical forecasting, foresight technology is proactive (when we create events ourselves in our life) in relation to future educational events in an educational organization or in class. This means that a teacher, as a foresight participant, does not simply assess the possibilities and risks of the occurrence of any educational events in an educational organization, but projects his or her current professional activity in such a way to strengthen positive trends and increase the probability of desirable educational events and prevent the negative undesirable ones.

We consider foresight as a personal technology that allows getting a desired image of the professional future and orient in some sequence of actions in its context. It is necessary to adhere to some basic principles of personal foresight: professional future depends on personal efforts – it is created; professional future is variable – it depends on the decisions of an individual and the parties involved; the future in education cannot be predicted reliably.

This requires the foresight competence in the educational activities of in-service teachers and the development of foresight competence of student teachers in the process of mastering the basic professional educational program (BPEP).

We understand teachers' foresight competence (FC) as an integrative multilevel personally-professionally education, which determines the ability and readiness to predict professional future as an activity of a research-reflexive nature.

Teacher's foresight competence is manifested in the positive motives of the choice of a teaching profession, a set of system knowledge, skills and abilities, experience of professional actions, reflexive activity, dialogical culture expressed in the theoretical and practical readiness and a teacher's ability to effectively solve educational and pedagogical tasks, tasks of professional growth and development.

Thus, student teachers who are focused on changing pedagogical technologies in the context of their professional future in an educational organization need to be able to respond to the challenges related to personal foresight: 1) how do they see their professional future; 2) are they ready to participate in the search for answers to various social and professional modernization; 3) to what extent do their developmental strategies depend on the current state of technological, social and educational environment; 4) what measures are they ready to undertake for deployment of various probable scenarios for their professional future.

Thus, the foresight competence formed by future teachers will allow modifying the personal profile of competencies throughout the professional and pedagogical career in an educational organization.

Research methods

The purpose of the research: theoretically substantiate and experimentally test the model of formation of teacher's foresight competence in the process of mastering the basic professional educational program in the field of training.

The theoretical concepts given above were implemented in the program of experimental work on the formation of FCs among student teachers in the process of doing educational modules (basic training module "Methodology, Methods and Organization of Professional Activity" and an elective training module "Designing Professional Perspectives").

Research methods

The following methods were used in the process of experimental work: theoretical (analysis, synthesis, pedagogical modeling); diagnostic (survey; testing, task method, content analysis); empirical (studying the experience of educational organizations, the study of normative and educational documentation, pedagogical including observation, activity product analysis); experimental (stating, shaping experiments); mathematical statistics methods. The methodology of the study: the research of self-regulation level and assessment of educational and professional activity; examining the motivation for choosing the teaching profession.

Experimental research base

The experimental base of the research was the Elabuga Institute of Kazan Federal University. Students of the third and fourth years of study (89 respondents) of the faculty of Psychology and Pedagogy mastering the educational program 44.03.05 Pedagogical Education (with two majors) took part in the program of experimental work.

Stages of research

The study of the problem was carried out in three stages. The theoretical analysis of the existing psychological and pedagogical approaches on the research problem has been carried out at the first stage; the problem, the purpose and methods of research have been highlighted, a plan of skilled and experimental work has been drawn up. At the second stage of the study, the structural-functional pedagogical model was designed and a technology for its implementation in the educational process was developed. The experimental work was conducted at the third stage of implementation of the pedagogical model into the educational process and also collecting, analysis and synthesis of empirical data.

Results

Structure and content of the model

The structural and functional model for the formation of future teacher's foresight competence was developed on the basis of system and activity approach, including targeted, informative, technological, result-evaluation structural components (Fig. 1).

Target component		
Objective: formation of FC, focused on the transformation of own professional actions and activities in general		
Tasks: development of a creative educational environment for the formation of the FC; formation of the motivational and instrumental components of self-regulation of educational and professional activities; mastering the techniques of self-control and the development of professional and personal reflection; designing special educational and professional pedagogical tasks that require subjectivity and dialogization of training		
Approaches: Practice-oriented, personal-activity, research, contextual	Principles: systemacity, consistency, activity, consciousness, productivity, communication and professional orientation, modular organization	
Content component		
Invariant component	Elective component	
Basic training module "Methodology, Methods and Organization of Professional Activity"	Elective training module "Designing Professional Perspectives"	
Technology component		
Methods	Form	Means
Game, case study, project method, problem-based learning methods, context-sensitive learning method	Classroom lecture and practical training, extracurricular professionally oriented group and individual classes, project seminars,	Educational and methodological literature, electronic educational resources, allowing to realize the acceleration, deepening, enrichment,

	independent educational research work	problematization of the content of training modules
Result evaluation component		
Components of the formation of FC		
Motivational and Value	Emotional-volitional	Reflexive
Indicators corresponding to the components of competence		
Presence of valuable orientations and motives for working with own professional future	Ability and readiness for self-regulation and overcome of psychological barriers in professional activity	Ability to turn to own professional and personal experience
Result: formation of FC		
Levels		
High	Medium	Low

Fig. 1. The model of the future teacher's foresight competence delopment

Stating stage

In order to study the motivation for choosing a teaching profession, we used the method of studying the motivation for studying at a higher educational institution by Ilyina (2002). In the course of the analysis of data we were guided by scales: motivation on acquisition of a profession, motivation on obtaining a diploma. The prevalence of motives on the first two scales demonstrates high educational and professional motivation (Table 1).

Table 1. The results of the study of motivation for teaching activity

o.	Tested	Number of students	Number of students with the high level of motivation on acquisition of knowledge in Pedagogy (from 9 till 12.6 points)	
			Quantity (people)	Percent from selection (%)
.	3rd year students	44	42	96.6
.	4th year students	45	42	95.2
.	Total:	89	84	95.3
o.	Tested	Number of students	Number of students with a high level of motivation to master a profession (from 8 to 10 points)	
			Quantity (people)	Percent from selection (%)
.	3rd year students	44	40	92

.	4th year students	45	41	93
.	Total:	89	81	92.5

As the results show, 95.3% of students in the studied selection demonstrated the dominance of motivation for acquiring knowledge in the subject field of Pedagogy, 92.5% showed a high motivation for mastering the teaching profession.

It was offered to write an essay on the topic "My progress in mastering the teaching profession" for this group of students. The following units of analysis were highlighted: 1) students' satisfaction with their current level of professional and pedagogical competencies; 2) taking into account the abilities of students in the process of mastering the teaching content of the educational program modules.

The analysis of the essay texts made it possible to draw the following conclusions: the students are not satisfied with the level of development of their professional and pedagogical competencies; they consider that their potential (intellectual, emotional, personal) is not fully realized; that the traditional pedagogical technology of teaching does not allow them to master new competencies to a higher level; the higher the level of motivation for the development of professional activity, the higher the dissatisfaction with traditional technologies for competence development. This indicates a negative emotional assessment of highly motivated students by the traditional model of the formation of professional competencies, in which they are included.

Further, a group of students was offered to participate in the experimental program for the development of foresight competence in the process of mastering the basic educational module "Methodology, Methods and Organization of Professional Activity" and the elective educational module "Designing the Professional Perspectives". Students of the experimental (44) and control group (45) were acquainted with the purpose, forms and content of educational and professional activities that ensure the development of foresight competence.

To study the emotional-volitional and reflexive components of students' foresight competence, the method of studying the level of self-regulation and evaluation of educational and professional activity was used (Morosanova, 1995).

The formation of structural components (emotional-volitional, motivational and value, reflexive) FC are differed by us at three value levels: low level (T=0-29), medium level (T=30-69), high level (T=70-100).

The implementation of the experimental program was started from the determining of the initial level of the components of the foresight competence (emotional-volitional, motivational and valuable, and reflexive) as an average value of its indicators in the studied groups of students (Table 2).

Table 2. The initial level of the components of the students' foresight competence in the experimental and control groups

Group	Motivational and value component	Emotional-volitional component	Reflexive component
Control group	58.6	61.4	55.6
Experimental group	63.8	62.4	57.8

The level analysis of the formation of students' foresight-competence components allows us to state: the motivational and value component reflecting educational and professional motives and values (63.8 in the experimental group; students of the control group demonstrated an average level of motivational and value component) and the emotional-volitional component reflecting the ability to self-regulation in professional activity and professional communication (62.4 in the experimental group, 61.4 in the control group). The reflexive component reflecting the ability to self-analysis, the ability to determine their learning trajectory independently, i.e. to set goals and be responsible for the final result, is also at an average level of development (57.8 in the experimental group, 55.6 in the control group).

The method of calculating Student's t-test was used to assess the reliability of differences in the components of students' foresight competence of the studied groups. A critical value of 1.99 was obtained with $p \leq 0.05$. The obtained value of t_{emp} in the emotional-volitional and reflexive components suggests that the indicators of the control and experimental groups are equivalent in all components of the foresight competence and have the same level of development.

Formative stage

"The Model of Foresight Competence Formation" was implemented in the process of organizing experimental work with an experimental group.

The process of forming the FC required not only the structuring of the training modules content, but also the realization of the possibility of constructing the individual routes for learning educational content, taking into account the abilities of students. The variant of asynchronous mastering of the training module was used in the experimental work. The individual route of mastering the educational module was determined by the educational needs, by the individual abilities and capabilities of a specific student (the level of readiness to master the program of the module). The following types of individual routes for the development of training modules were distinguished in the experimental program: the route oriented towards the knowledge of one's own characteristics, abilities, and possibilities of learning professional activities; the route connected with an increase in readiness to solve educational and professional pedagogical tasks (EPPT); the route aimed at the student's willingness to apply competences in specific professionally-oriented situations.

The following has been done to build a creative, professional-oriented environment of the training module: additional psychological, pedagogical and methodological training of the teaching staff (realizing the curriculum of the training module) has been carried out, aimed at mastering their competences to organize the work with students with different levels of abilities. Qualitative analysis of students' abilities participating in the experimental program was carried out, defining the prospects of their professional development. A reasonable system of diagnostic indicators of FC formation was developed and applied. A step-by-step "immersion" of students in educational, training and professional situations was implemented. It enabled them to master FC components in a motivated and conscious manner.

Comparative analysis of the results of the study on FC development in students of experimental and control groups obtained during the final testing has revealed differences in the component levels. (Table 3).

Table 3. The final level of development of FC components in experimental and control groups

Group	Motivational and	Emotional-	Reflexi

	value component	volitional component	ve component
Control group	63.83	67.63	57.49
Experimental group	75	69.83	77.54

In the experimental group after the introduction of FC formation model, a high level of formation has a motivational and value component (75) reflecting educational and professional motives and values, and a reflexive component (77.54) reflecting the ability to self-analysis of their professional actions and the ability to solve EPPT. The emotional-volitional (69.83) component reflecting the ability to self-regulate in the field of foresight educational and professional teaching activities remained at an average level among some students of the experimental group. Thus, 89% of students of the experimental group have a high level of FC.

In the control group, a different situation was observed: motivational and value (63.83), emotional-volitional (67.63) and reflexive (57.49) components of the FC remained at the average level of development.

The method of calculating the Student's t-test was used to assess the reliability of the differences in the final indicators of the FC components of the experimental and control groups of students. Statistically significant differences in motivational and value ($t=7.9$; $p<0.01$) and reflexive components ($t=8.6$; $p<0.01$) of foresight competence were found. There were no statistically significant differences in the emotional-volitional component among students of the studied groups. The given results can be interpreted as follows. The students included in the curriculum of the training module aimed at implementing the model of formation of FC differ from the students who were engaged in the traditional program, by statistically significant high level of motivational-value and reflexive components.

A post experimental survey was conducted with the students who had taken part in the experimental work. The participants of the experimental program were offered to re-examine the text of their essay "My Progress in Mastering the Teaching Profession" and make changes if they want. The text of the revised essay was analyzed using the same units of analysis. Conclusions after text processing of post-experimental essay: satisfaction with the technology of developing professional competencies has not changed in the control group. The experimental group noted: 1) the level of proficiency in professional pedagogical competencies has increased; 2) the level of independence in mastering the content of the educational program has increased; 3) the work in small groups on the decision of the EPPT allows updating the subject-subject relations and abilities to a full extent; 4) satisfaction with the process of mastering educational content has increased. Therefore, the qualitative emotional assessment of the key elements of the FC development model by students of the experimental group is positive.

After mastering the content of the training modules, students participating in the experimental work evaluated its results according to two criteria: effectiveness of the training module's program, satisfaction with the results of the training practice of the module (Tables 4, 5).

Table 4. Students' evaluation of the effectiveness of the training module program (0 - not manifested, 3 - manifested to the maximum)

Estimated value	Average point
Personally-focused orientation	2

Motivational potential of the program	3
Developing potential of the program	2
Practical orientation of the program	3
Selection of forms and methods of content deployment of training material program module	2
Amount of points (maximum point 15)	12

Table 5. Assessing the degree of satisfaction with the results of the module's training practices (1 - not satisfied, 3 - satisfied)

Estimated value	Average point
Possibility to master the declared competencies	3
Ability to test their professional competencies in a particular organization	3
Possibility to collect and prepare practical material for scientific research on the problems of future professional activity	3
Quality and correspondence of the module content for future professional activity	2
Amount of points (maximum point 12)	8

This allow us to conclude that the students participating in the experimental program are satisfied with its results.

Discussion Questions

Having analyzed the psychological and pedagogical literature, we can state about a lack of special studies on the development of future teacher's foresight competence in the process of mastering the educational program of professional training. However, the issue of meta-competence development, to which we refer foresight competence, is considered in detail. For example, reflexive meta-competence (individual professional competence in the model by Markova (1996); autopsychological competence in the model by Kuzmina (1990); forecasts, management and control of the future development of the educational environment is subjective; availability of the motivational and instrumental component: "I am not only able to predict my professional future, but I am ready to make it". In our opinion, foresight competence should be considered as meta-competence. By mastering the value, emotional, and reflexive mechanisms, a would-be teacher will be able to adequately develop all other types of professional competence, which will be needed in connection with the processes of modernization in education. The foresight ability and mastery of its mechanisms allows forming one's own professional values and principles, determining the strategy of one's own professional development, encourages constant self-development and creative transformation (if necessary) of professional activity.

Conclusion

The proposed model of FC development, which specifically unfolds a consistent transition from educational to professional activities, kindles an interest in the acquisition of professional knowledge, professional activities and holistic professional activities. The students highly appreciate an opportunity to

form professional actions in the process of solving the EPPT in the field under study and use the forms and methods of work focused on the real professional activity.

It has been established that in the process of mastering the training modules (basic and optional) of the BPEP, the holistic subject and social content of the future professionsk activity is modeled. At the same time, the entire educational potential of students' activity is fulfilled, namely from the individual perception of the educational content to the socio-professional activity within the social environment of the educational organization.

With the help of the system of adequate forms and pedagogical technologies in the training modules, the development from competencies provided by the basic professional educational program to professionally oriented foresight competence is achieved. Mastering the experience of professional activity is carried out in the course of solving simulated professional situations in educational events of training modules, which provides the conditions for the formation of cognitive and professionally-oriented motives of students and with them the transformation of the academic procedure of mastering knowledge in the professional activities of future specialists. Then, the educational program is a process of "unfolding" during the transition from quasi-professional training activities, from the awareness of value orientations and motives of working with one's own professional future to readiness to turn to one's own transformation of professional and personal experience, which significantly improves the quality of vocational training.

Thus, the development of foresight competence of future teachers will increase the level of professional and pedagogical training of teachers, and as a consequence, increase the level of development of students, which meets not only the modern requirements prescribed in various concepts and educational programs, but also helps society to develop in accordance with the program of state development.

References

Asadullin, R. M., & Tukhvatullin, R. M. (2014). Foresight-method in the pedagogical design of the information and education environment of higher education institution. *Kazan Pedagogical Journal, 5*, 36-47.

Akhtarieva, R. F., & Shapirova, R. R. (2016). On the formation of foresight teacher competencies. *Scientific Almanac, 1-2(15),* 44-47.

Akhtarieva, R. F., & Shapirova, R. R. (2017). Formation of foresight competencies of the teacher in the conditions of intensive development of android technology. *Scientific Almanac, 1-2(27),* 32-36.

Dibrova, Sh. N. (2014). Foresight as a modern practice of university management. *Scientific Journal NRU ITMO. Series "Economics and Environmental Management", 1,* 56-65.

Evzrezov, D. V., & Maier, B. O. (2014). "Education 2030" is a challenge to the education system. 1. Foresight education plan to create "One Button People*"? Novosibirsk State Pedagogical Bulletin, 2*, 118-132.

Kryukov, S. V. (2010). Foresight: from forecast to the formation of the future. *Terra Economicus, 8*(3), 7-17.

Kuzmina, N. V. (1990). *The professionalism of teacher personality and industrial training.* Moscow: Vysschaya Shkola.

Markova, A. K. (1996). *Psychology of professionalism.* Moscow: Znanie.

Morosanova, V. I. (1995). Individual style of self-regulation in arbitrary human activity *Psychological Journal, 4*, 26-35.

Obushchenko, S. I. (2007). Educational Foresight of the quality and performance of additional education as the goal of the modernization of the activity of the UDD. *Izvestia: Herzen State University Journal of Humanities and Science, 22*(53), 353-358.

Pereslegin, S. B. (2009). *Foresight workshop report.* Retrieved from http://www.vseminfo.ru/video/pereslegin/pereslegin-video_64.html

Rapid Foresight Methodology (2015). Retrieved from https://srosovet.ru/content/editor/Metodichka_foresight.pdf