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## A Tree of a Competence as a Tool of Researching Level of Training by Future Teachers'

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### Abstract

The paper is topical and up-to-date as analysis of regulatory documents showed that it is very important to develop managerial skills in future teachers so that they can successfully organize project activities of school leavers as this type of activity demonstrates how they have coped with the academic program of secondary education. As for the share of managerial skills in the pedagogical profession, the analysis of the regulatory documents showed that the most part of functions and competences are connected with management. Still FSES competences do not include the ability of managing pupils' project activities as a part of educational profession. Thus, we offer to add the managerial competence to the list. This competence shows if one is able to manage pupils' project activities in accordance with the requirements of FSES. The aim of the research is to find out the structure of the competence which characterizes the ability of future teachers to manage pupils' project activities. The research methods, such as look-back analysis and generalization of the research results content, helped us to state the grounds for distinguishing the professional competence and its structure. The methods also include decomposition of the competence, comparing the content of the professional standard of a teacher with the FSES HE so as to compare the managerial functions and managerial competences. The offered components, criteria, and tools let us see the formation level of structural components of the professional competence, to find the perspective trends of the activity which could help to increase effectiveness of teaching future teachers how to manage project activities of secondary school pupils.

*Keywords:* professional competence, professional standard, ability to manage project activities, pupils' project activities, teaching future teachers.

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## **Introduction**

Nowadays the managerial competence of teachers is considered an important professional skill. The analysis of teachers' professional standard (Ministry of Labor and Social Protection of the Russian Federation, 2013), FSES of higher education "Pedagogical Education" (baccalaureate) (Ministry of Education and Science, 2018), FSES of secondary education (Ministry of Education and Science, 2010), showed that it is very important to develop managerial skills in future teachers so that they can successfully organize project activities of school leavers as this type of activity demonstrates the result of their coping with the secondary education academic program (Shakirova, 2020).

As a result of analyzing teachers' professional standard and FSES of higher education of the specialization 44.03.05 Pedagogical education (two profiles) (further – FSES HE) as for the share of managerial skills in the pedagogical profession, it was found out that the most part of functions (69.7%) and competences (56%) are connected with management. The results of the analysis of regulatory documents could be proved by the theoretical research of importance of pedagogical management in future teachers' work (Margolis, 2014).

One of the professional functions is mentioned in the professional standard of teachers: "professional activity in accordance with the requirements of the federal state educational standard, including that of basic secondary education". Also, according to 18.1.3 FSES of basic secondary education, "the system of assessing the results of mastering the basic educational program of general secondary education should include assessing project activity (Ministry of Education and Science, 2010).

Thus, it is topical to teach future teachers to manage project activity of secondary school pupils and include it in the syllabus.

Using the method of comparative analysis, we have found out that there is some disconnection between the job description of a future teacher stated in the job standard and the general and universal competences stated in FSES HE. The disconnection concerns managing project activity of secondary school pupils by future teachers. In general, it means that there is a disconnection between the syllabus of future teachers and the professional functions which they must perform in their work.

The disconnection determines the issue of researching how they form the skill of managing project activity of secondary school pupils in future teachers. Thus, we offer to point out the managerial competence which is necessary for solving a professional issue of future teachers, i. e. the ability to manage pupils' project activities in accordance with the requirements of FSES.

### **Purpose and objectives of the study**

The aim of the research is to find out the structure of the competence which characterizes the ability of future teachers to manage pupils' project activities.

The research project tasks:

- 1) to distinguish structural components of the professional competence characterizing the ability of future teachers to manage project activity of their pupils;
- 2) to point out the criteria and indices of the professional competence characterizing the ability of future teachers to manage project activity of their pupils;
- 3) to set the levels of the professional competence characterizing the ability of future teachers to manage project activity of their pupils;
- 4) to work out a tree of the professional competence as a tool of assessing and stating the level of the professional competence characterizing the ability of future teachers to manage project activity of their pupils;
- 5) to work out diagnostic tools for assessing the level of the professional competence characterizing the ability of future teachers to manage project activity of their pupils.

### **Literature review**

In order to state the components of professional competence, it is necessary to define the conception of "competence" and the structure of it.

Uiddet and Holliford (2003) consider a competence as the ability necessary for coping with tasks at work and achieving the needed result. Raven (2002) considers a competence as an ability to effectively cope with a certain task in a certain sphere; it requires special knowledge, skills, ways of thinking, and taking on the responsibility for the result. L. Spencer and S. Spencer (1993) believe that a competence includes such elements as motives, attitudes, values, knowledge, cognitive and behavioral skills, and a wish to do one's work well. Tatur (2004) deals with competences in higher education.

The researcher defines professional competence as an integral part of a personality which characterizes one's wish and ability to use one's potential (knowledge, skills, experience, and personal features) for one's successful activity in a certain sphere. Shadrikov (2007) defines a competence as a systematic use of knowledge, skills, abilities, and personal features which let successfully cope with functional tasks of one's profession, of one's work.

It is also necessary to consider the definitions of management.

Mescon, Albert and Khedouri (2004), the prominent representatives of the classical school of management, define management as a process of planning, organizing, motivating, and controlling. This process aims at setting tasks and achieving aims of an organization or a firm. Tsibulnikova (2010) analyses definitions of management in education and writes that the definition of management could be considered from different viewpoints, such as activity, influence of the management subject on the management object, interaction of the subjects; as a process, a succession of actions: analysis, planning, organization, motivation, control, and regulation; as a function of an organized system and as a system itself.

Forming managerial competences is considered by Sarafanova (2012), Gadzhiev (2012), Islamov (2015), Shakirova and Buldakova (2019). The issue of assessing the level of students' managerial competence is considered in the works of Sarafanova (2012) and Nikitovskaya (2018). Gadzhiev (2012) interprets the category "managerial competence" as an ability to choose the way of influencing and to influence the managerial object aiming at getting the results required in conditions of restricted resources, taking account of the possible outcome.

The paper is also based on the ideas of the researchers (Zimnyaya, 2003, 2009; Prozorova, 2015; Kutuev, Kudyasheva, Buldakova, Aleksandrova & Vasilenko, 2016) who consider a competence an integral characteristic. For defining its level, it is necessary to work out the structure of the competence and the criteria and indices of its measuring.

Zimnyaya (2003, 2009) supposes that each competence consists of its main components: cognitive (knowledge on the subject, methods, means, and ways of activity), praxiological (skills, habits, experience of the activity and reflexive abilities) and axiological (attitude to the activity). Prozorova (2015), Odarich and Tretyakova (2018) believe that the structure of a competence includes main components: knowledge, skills, habits, and important personal features, motives.

Prozorova (2015) names four main criteria of the level of professional competence: cognitive (using knowledge for solving professional tasks), value-based (attitude to the professional activity), activity-based (activity in solving professional tasks), and axiological (ability to self-analyze one's readiness for work).

In the literature on competence-based approach scholars mention structural components of the managerial competence: value-motivational, cognitive, activity-based, reflexive-axiological (Krokhina, Aleksandrova, Buldakova, Ashrafullina & Shinkaruk, 2016).

The criteria of the level of the professional competence are chosen in accordance with the above-mentioned structure: value-motivational, cognitive, activity-based, and reflexive-axiological.

A. Novikov and D. Novikov (2014) consider that criteria should meet the following requirements: be objective in making assessment, fit adequately the phenomenon they measure; there should be a full set of criteria for characterizing the researched process. Ivanova (2010) adds that criteria should reflect the dynamics of the quality under research, while indices show the quantitative characteristics.

For assessing the stage of formation of professional competences a level-grounded approach is used: "low – medium – high". A low level implies having some idea of professional functions, a medium level means some special skills and habits, and a high level means the ability to cope with tasks using special knowledge, skills, and habits.

Galimzyanov, Popov and Storozheva (2017) for assessing the stage of formation of competences in the system of higher education offers the following levels: "threshold, intermediate, advanced". For instance, bachelors have a general idea of the activity and they know the main laws of functioning of the professional objects, the methods and algorithms of solving tasks in practice, so that competences formation at the bachelors' stage supposes a threshold level. The ability to solve typical tasks, to make professional and managerial decisions according to certain algorithms, rules, and methods supposes the intermediate level. The advanced level suggests that they are ready to solve not only typical, but also difficult tasks in practice, to take professional and managerial decisions in difficult conditions, having no sufficient documentary, normative, and methodical support.

The literature analysis has shown that nowadays there is no universal scale of assessing the stage of formation of competences. We share the gradation of Sarafanova (2012) into low (threshold), medium (basic), and high levels.

As it was mentioned above, the managerial competence consists of qualitative (personal characteristics) and quantitative (knowledge, skills, habits) features. Ivanov (2008) considers that complex assessment of the stage of formation of a competence is possible only in real life conditions.

It is possible to mention that in choosing the criteria most researchers use a component approach. As for structural components of professional competences and the criteria of assessing the stage of their formation, the majority of researchers agree that these criteria are the following: value-motivational, cognitive, activity-based, and reflexive-axiological. Taking into account requirements of professional standards, it is necessary to show the criteria and indices in more detail, to characterize their stages of formation, and to work out the diagnostic tools.

The main principle of choosing the criteria is the objective one. It is characterized by univocity, authenticity, reliability, reproducibility of the data acquired. The criteria should be grounded in the systematic approach (each criterion is connected with the others on the basis of mutual complementarities and each criterion provides an integrated view of a phenomenon or a process).

### **Methodology**

The principle of selecting research literature on the issue and stating the methodological basis of the research depended on the principle if separate components of the research field are developed well enough. The components included the analysis of the concept “competence” and of its components, competence approach to the structure of higher education, management in its traditional sense and pedagogical management in educational environment.

Different approaches to the definition of competence approach and content analysis of the concept “competence” were considered (Uiddet & Holliford, 2003; Raven, 2002; L. Spencer & Spencer, 1993; Tatur, 2004; Shadrikov, 2007).

We considered the conceptions (Zimnyaya, 2003, 2009; Prozorova, 2015; Odarich and Tretyakova, 2018; Krokhtina et al., 2016) of defining competence structural components, as well as of assessing the level of formation of managerial competences. The criteria should comply with certain requirements (A. Novikov & D. Novikov, 2010; Ivanova, 2010). We also considered the conceptions of the levels of formation of the competence (Galimzyanov et al., 2017; Sarafanova, 2012).

The main methods of researching the problem are theoretical ones. The documents and normative regulations of managing project activity of secondary school pupils ground the necessity to teach future teachers this type of pedagogical management. The analysis of pedagogical experience from the viewpoint of systematic, activity, person-oriented, and competence approaches helped us to single out the components and to formulate the criteria of the professional competence, the ability to manage project activity of secondary school pupils, to state its components and the levels of its formation. We used the method of competence decomposition into structural elements in the form of a tree. We also used empirical methods, such as analysis and comparison of the federal state educational standards of higher education as for its requirements to the results of professional education and to the job standard of a teacher. We compared managerial job functions with managerial competences. We generalized the content of scientific papers on the issues of formation of professional competences. The methods used in the work helped us to state and ground the pedagogical criteria and their indices of assessing the formation of professional competences.

The systematic, competence, activity, and person-oriented approaches form the methodological basis of choosing the criteria. It is vital that the systematic approach to the criteria of forming the professional competence helps to state the interconnection and cooperation between all the structural components and achievement of the common aim of forming the professional competence in future teachers. According to the person-oriented approach, it is necessary to state individual qualities of students and their value-based orientations which contribute to solving practical tasks, to their self-development and self-realization in the future work in the sphere of pedagogical management. The activity approach supposes that the abilities and skills of using one's knowledge in practice in the sphere of managing project activity contribute to professional experience and thus we have to include them in the criteria. The competence approach in finding the criteria helps to state the content of professional competences formed in the course of higher school educational process.

#### *Research stages*

At the first stage the analysis of regulations and research literature on the issue of requirements to the structural components, its content and grounding the criteria of forming the professional competence of future teachers was done. At the second stage the criteria and indices of forming the professional competence of future teachers to manage project activity of pupils were pointed out in accordance with the structural components: value-motivational, cognitive, activity-based, and reflexive-axiological. At the third stage the authors indicated and described the characteristics of the stages of forming the professional competence; diagnostic tools were developed.

## **Results**

The analysis of the concept “competence” in the literature puts a task of revealing the content of the competence considered in the research, as well as the task of defining its measurable structural components and finding out the stage of their formation.

Thus, in accordance with the approaches considered, the structural components of the managerial competence were defined: value-motivational, cognitive, activity-based, and reflexive-axiological.

Taking into account the specificity of managing project activity it is possible to reveal the componential characteristics of the professional competence: the ability to manage pupils’ project activity according to the requirements of federal state educational standards.

The value-motivational component supposes having or forming the motives of professional pedagogical activity, having general value orientations, particularly, future teachers’ understanding of the necessity of carrying out project activity together with pupils in the process of work, as well as understanding the importance of its managing, so that the project activity achieves the needed effect. Formation of this component serves as the ground of the activity motive for managing project activity of pupils.

The cognitive component means managerial-pedagogical knowledge in the sphere of organizing and managing project activity of pupils, the knowledge should be stable and well-understood. Formation of the component contributes to development of students’ learning activity and self-reliance.

The activity-based component supposes the ability to apply the knowledge, skills, and habits in definite situations, to solve different managerial tasks of supporting pupils’ project activity. The process of forming the activity-based component allows getting practical experience in organizing and managing pupils’ project activity and showing initiative in solving professional tasks.

The reflexive-axiological component supposes the ability to analyze one’s own managerial activity and other participants’ activity in the project, to assess the results of the project activity and of its management. This component means that the students understand the results of their activity; they can estimate the results and they are ready for further self-realization and self-development.

Taking into account the value and importance of the above-mentioned components taken collectively, as a whole, as a result of forming the competence, in accordance with the research approach, we point out the criteria of forming future teachers’ professional competence of managing pupils’ project activity: value-motivational, cognitive, activity-based, and reflexive-axiological.

This approach is grounded in the fact that at the stage of integrated assessment of the competence levels each structural component of the competence is to be taken into account and interconnection and interdependence of formation of each component is to be traced out.

The value-motivational criterion helps to assess formation of one's motives for professional pedagogical activity and interest in it. The cognitive criterion reflects the degree of formation of knowledge on pedagogical management of pupils' project activity and its reliability. The activity-based criterion allows stating the level of skills and habits formed on the basis of one's knowledge in solving professional tasks. The reflexive-axiological criterion helps to state the ability for feedback, if the activity is successful, and if there are any possible ways of its improvement when needed.

Each criterion has a set of features. Their content and quality are reflected according to the level of the criterion's formation and they enable one to assess the efficiency of the process of forming the professional competence.

The index can be defined as a component of the criterion. It is not easy to define the indices of the criteria correctly and accurately, they should meet a list of requirements. A set of criteria and indices should not be too large and should provide as much necessary information as possible. It should be poly-aspect and particular. The indices should be diagnostic, they should provide the ability to observe, fix, account, and interpret. Defining the indices should be in accordance with the criterion under consideration and it should fully reflect its specific characteristics.

According to the value-motivational criterion, the indices of the ability of assessing the formation degree of the professional competence which indicates future teachers' ability to manage pupils' project activity, are the following: understanding the importance of pupils' project activity for achieving educational results, motivational readiness and valuing attitude to managing project activity as the most effective way of getting the results planned, and domination of motives of teaching and learning. The indices of the cognitive criterion are the ability to carry out analysis and synthesis of pedagogical phenomena during project activity on the basis of knowledge of the project results in accordance with FSES requirements and the ways of achieving educational results; volume, durability, and understanding of the knowledge on the basis of pedagogical management (ways, functions, stages) and the peculiarities of the content of project activity according to individual and age-related characteristics. The indices of the activity-based criterion show the skills of managing and achieving the goals, the skills of projective activity, effective communication, management, using knowledge on the subject taught in the activity.

The indices of the reflexive-axiological criterion are the ability to assess the degree of success in managing project activity, to see the ways of further development, to analyze one's readiness for managing project activity and analyzing possible problems, issues, and situations, as well as knowing and using ways of assessing the results of project activity.

As it was mentioned before, we distinguish three levels of competence formation: low – medium – high.

Superficial knowledge on the structure, processes, and componential parts of managing project activity, as well as difficulties and mistakes in using this knowledge in practice show a low level of competence formation. The skill is not complete; a student is able to perform only fragmental actions and operations. A medium (basic) level of competence formation supposes having some managerial knowledge and a student has some difficulty in applying knowledge in practice. Some skills and habits are well-formed, still one needs extra help in solving managerial tasks and finding the right decision of situational tasks. A student with a high level of competence formation has systematic knowledge, is able to apply the knowledge in practice, and acts effectively without assistance in managerial situations of organizing pupils' project activity.

The main index (indicator) of forming professional competences of a student consists in coping with a definite job function. According to the research results and the content analysis of the professional standard "Teacher", FSES of secondary education, we are able to formulate the content characteristics of components and levels of formation of the competence of future teachers.

We assess if the professional competence is fully formed in levels and we assess each component. A complex analysis of the indices, components, and levels of the competence formation lets us reliably estimate the formation degree of the ability to manage pupils' project activity by future teachers.

A level of formation of the professional competence is understood as a complex of degree and quality of structural components, on the whole it shows that future teachers are ready for managing pupils' project activity as it is an effective way of coping with the professional task. Each component has the following content characteristics for stating the level of formation (high, medium, low).

To state the level of the value-motivational component, it is important to take into account outer negative motivation, inner positive and negative motivation, as well as understanding and accepting the importance of project activity and managing this activity as an effective way to achieve the needed result. If the value-motivational component is not formed, outer negative motivation prevails over inner and outer positive motivation.

If the component is formed on a low level, the motives of escaping failures and of getting the diploma prevail and the importance of project activity is poorly understood, the need of managing the process is also not understood. If the component is formed on a medium level, the wish to get a high social status and high wages prevails in students, the importance of project activity is taken in. With a high level of formation of the component students feel a need in personal development and professional growth, they are striving for getting the results in the profession. They understand and value project activity and its management as a way of getting the needed results effectively.

If a cognitive component is formed on a low level, a student shows unsystematic fragmental knowledge on project activity and management functions. It means that a student recognizes and names the characteristic features of the object but his/her knowledge is not systematic. On a medium level a student explains, describes, and differentiates facts and phenomena. A future teacher with a high level of the competence is able to characterize, classify, and compare the objects studied. They are able to effectively use the knowledge. The knowledge is good and systematic, which is enough for solving professional tasks of managing project activity.

The activity-based component on a low level consists in the ability to apply some knowledge for solving some professional tasks; a future teacher is able to cope with typical tasks according to an example. If the activity-based component is formed on a medium level, a student is able to apply the knowledge for solving situational tasks, to define, assess, and set the priorities in solving problems. The student's activity is selective in character. A high level means that a student is able to use systematic knowledge in solving professional tasks in managing project activity using both standard and newly-formed ways.

The reflexive-axiological component on a low level supposes a slight ability to analyze reasons and consequences of problematic situations with the help of a teacher or according to the algorithm offered before. If the reflexive-axiological component is formed on a medium level, a future teacher is able to plan activity without any help, using his/her skills in analyzing. Students with a high level of the competence component have skills of analysis and self-analysis and use them in their activity, having assessed the results they find, the ways of mastering and improving their future activity.

According the method of decompositions the constituent elements of the competence are shown in a tree of competences (Fig. 1). The tree of competences can be used for assessing the competence, it helps to choose what should be tested and in what way. This competence tree can also be used as a mechanism of forming the necessary set of testing tasks and for assessing each competence (Dorokhova, 2015).

Special diagnostic tools were worked out according to grounding and characteristics of the criteria and their indices, on the basis of a visualized analysis in the form of a tree of professional competence; aiming at the ability to assess to what level the competence is formed. The competence under research supposes having specialized knowledge, skills, and habits, so that we worked out a complex questionnaire and a test which can help to state on what componential level the criteria are formed. Also, reliable and valid methods are offered as for the criteria: value-motivational, cognitive, activity-based, and reflexive-axiological.

For assessing the level of forming the value-motivational component, the method of Zamfir in Rean's modification "Motivation of professional activity" (Rean, 2006) is chosen. The main aim of the method is to state the motives for inner and outer motivation. The most optimal composition consists in domination of internal motivation over external positive and negative motivation. Internal motivation is characterized by the wish to enjoy the process and the result of work and readiness to realize oneself in one's profession.

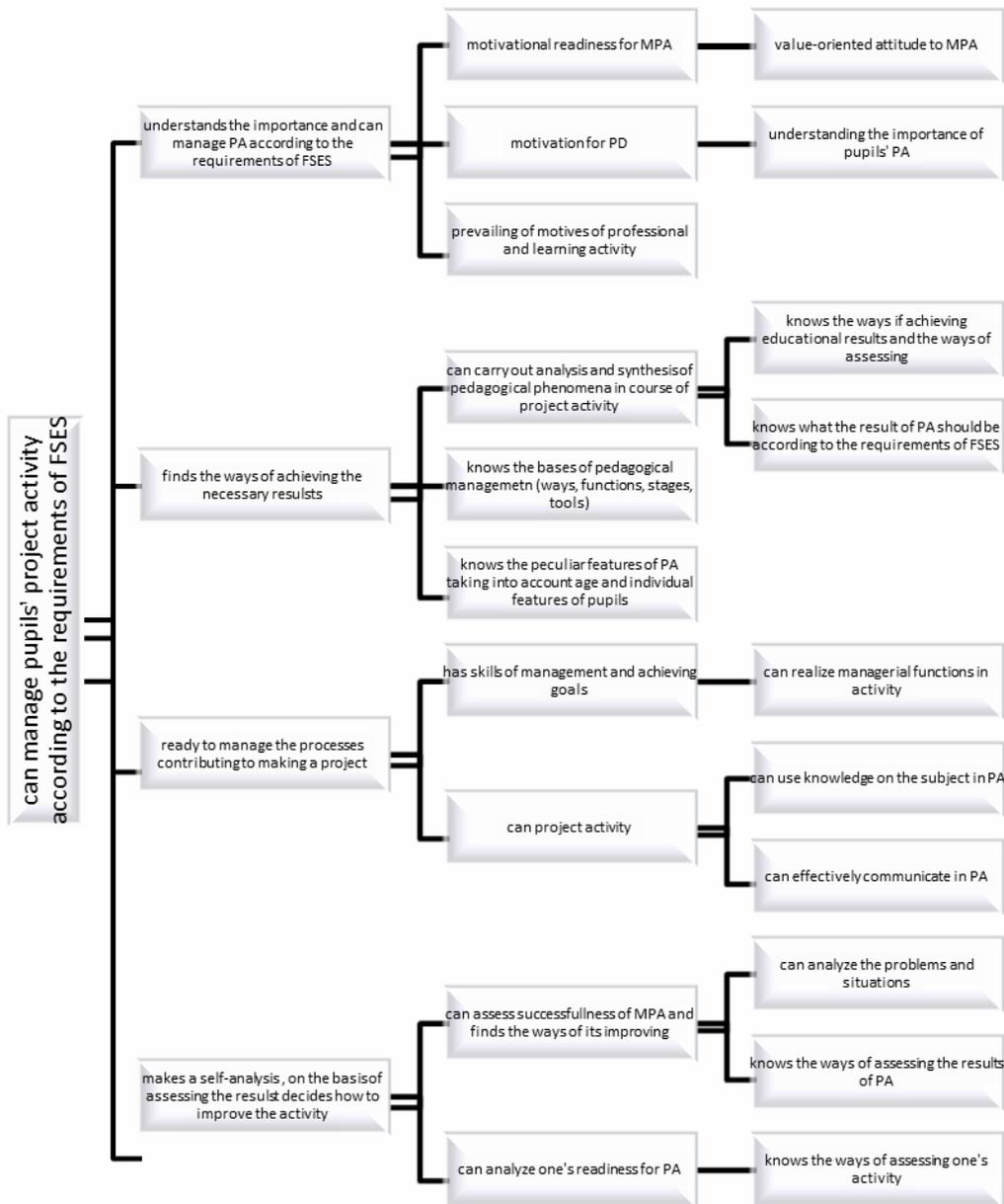


Figure 1. The tree of competences as a means of assessing the ability to manage pupils’ project activity

We added a questionnaire to this method, its aim was to state the value-based attitude to project activity and the degree of motivational readiness for managing secondary school pupils' project activity. The questions help to state if the students are motivated for project activity, their value-based attitude to managing project activity. We asked to what degree managing pupils' project activity by the teacher influences the effect of project activity: a) slight, b) considerable, c) very important. Or it was asked to continue the sentence: I need the competence of managing pupils' project activity for... Also, the questions help future teachers to assess their motivational degree of readiness for managing project activity (not ready, ready to a low degree, to a medium degree, to a high degree).

For assessing the cognitive component we prepared a test with tasks of different complexity levels (definition of concepts and ideas, multiple choice, yes/no questions). The tasks let us check the level of knowledge. The questions of the test aim at finding out on what level the knowledge is formed on project activity (the content of the main concepts, stages, types of projects, components, results); knowledge on the basis of management, knowledge on dealing with regulation documents on the process of secondary school pupils' project activity, knowledge on the characteristics of the content of pupils' project activity depending on their age and individual features, as well as ways of achieving results in teaching.

Assessing the degree of formation of the activity-based component could be done through solving situational tasks of different levels of complexity made on the basis of future teachers' experience. The tasks were worked out and offered in form of practice-oriented tasks and they aim at stating the skills of management and achieving goals, these are the ability to put an aim, to motivate pupils to project activity, the ability to plan, to organize and manage project activity, to control, to correct, to organize activity and communication in project activity, the ability to be oriented to the result, to manage conflicts, to use knowledge on the subject and ways of management.

Also Nemov's method "Pedagogical situations" was used (Nemov, 2001). This method lets draw the conclusion on pedagogical gift of future teachers judging from the way they solve pedagogical tasks, cope with challengeable situations. The structure and levels of pedagogical gift are most fully considered by Kuzmina (1990). She points out perceptive-reflexive, gnostical, projecting, constructive, communicative, and organizational pedagogical gifts. The content of the gifts is full, they fully reflect the gifts needed for pedagogical management exemplified in project activity of pupils.

To define the level of forming the reflexive-axiological component the method "Stating the level of pedagogical self-analysis" (Kalashnikova, 1999) was used. The method let us assess the level of self-analysis skills and habits.

Also, we worked out questions in order to find out to what level the skills to analyze and assess one's own activity and pupils' project activity results are formed. The answers to the questions reveal the results of self-assessing the ability of self-analysis and of assessing the project activity results, the ability to assess one's readiness to teach pupils project activity and readiness of managing pupils' project activity.

## **Discussion**

The research topicality is conditioned by the fact that the traditional criteria and the content of their indices do not agree with each other, as for assessing the levels of formation of the professional competence which characterizes the ability to manage project activity of secondary school pupils by future teachers in accordance with the professional standards. The literature analysis showed that different authors consider the concepts "competence", "criterion", and "index" in a different way. Some authors do not differentiate them. The paper examines different approaches to selecting the criteria and indices of formation of professional competence of future teachers. These approaches interpret the criteria of formation of professional competence as a set of objective indices showing qualitative characteristics of its state. They can help to state its peculiar features and to assess formation of structural components in the process of teaching activity. The criteria, indices, and the diagnostic tools allow to state the level of formation of the structural components of competence in the teaching process at higher educational establishments, as well as to show the perspective trends of the activity contributing to an increase in the efficiency of the process of forming professional competences of future teachers and forming professional competences in professional training of teachers.

We show each criterion with the help of the system of empirical indices. Their intensity shows the level of formation of the criterion. This allows assessing the efficiency of the process of formation of the professional competence.

It is necessary to note that it is not possible to state the levels without researching the work results and the personal attitude of the future teacher to the work. Each level includes its special elements which are different from those of the lower and higher levels. The level of formation of each structural component of professional competences is determined by formation of the indices included in the criterion. Stating and assessing the levels of formation of professional competences allows working out and putting into practice individual educational routes of pupils. It improves the quality of future teachers' professional training.

In the future the diagnostic tools are to be tested in order to state the level of formation of the competence.

The research results show promising trends in organizing the activity of improving efficiency of formation of the professional competence of future teachers and in the professional training of teachers.

## **Conclusion**

In the process of researching how the ability of future teachers to manage project activity is formed it is necessary to study the characteristics of formation of the competence. It should be done for stating the level of the competence of future teachers in the process of getting higher education. It can help to find promising areas for the activity, to increase the efficiency of the process of teaching future teachers how to manage project activity of secondary school pupils.

We pointed out the criteria and characterized the indices, structural components, and levels of formation of the professional competence of managing pupils' project activity by future teachers. The level of the competence formation should be stated in an integrative way, taking into account the formation of the constituent components in total. The level of formation of each structural component of the competence can be stated judging from the level of formation of the indices included in a certain criterion.

The definition of structural components, volume, and content of the teaching elements needed for the necessary knowledge and skills, as well as assessing the levels of formation of the professional competences are to contribute to improving the quality of professional training of future teachers.

The diagnostic tools offered in the research will be tested in the future for the sake of stating the level of formation of competence. The competence characterizes the ability of future teachers to manage project activity of secondary school pupils, to meet the requirements of the teacher's professional standard, and to improve the process of forming the professional competence at higher school.

The research results, namely the diagnostic tools, could be applied in educational establishments for the purpose of stating to what degree teachers are ready for managing pupils' project activity.

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## **Competing interests**

The authors have declared that no competing interests exist.

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