

Research of students' cognitive activity

Investigación de la actividad cognitiva de los estudiantes

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ABSTRACT:

The important condition of professional training in the educational process is a student's cognitive activity. Students' professional competence in the university system of bachelors' training is provided by introduction of innovative technologies into the educational process on the one hand and a students' cognitive activity in this process on the other hand. Solution of a question about the students' cognitive activity growth is connected with the development of modern pedagogical technologies. The article touches upon the experience of the students' cognitive activity growth in the educative process.

Keywords: : cognitive activity; professional competence; cognitive activity development factors; cognitive activity structure; students' cognitive activity measurement criteria; cognitive activity development levels.

RESUMEN:

La condición importante de la formación profesional en el proceso educativo es la actividad cognitiva del alumno. La competencia profesional de los estudiantes en el sistema universitario de formación de solteros se proporciona mediante la introducción de tecnologías innovadoras en el proceso educativo, por un lado, y la actividad cognitiva de los estudiantes en este proceso, por el otro. La solución de una pregunta sobre el crecimiento de la actividad cognitiva de los estudiantes está relacionada con el desarrollo de tecnologías pedagógicas modernas. El artículo toca la experiencia del crecimiento de la actividad cognitiva de los estudiantes en el proceso educativo.

Palabras clave: actividad cognitiva; competencia profesional; factores de desarrollo de la actividad cognitiva; estructura de actividad cognitiva; criterios de medición de la actividad cognitiva de los estudiantes; niveles de desarrollo de la actividad cognitiva.

1. Introduction

1.1. Problem of Research

The growth of professional competence and increased quality of the university training are closely connected with the interest to the learning process. The training experience has shown that a student remains in most cases passive in-class. Effectiveness of the learning process increases only if all the factors affecting students' cognitive activity are taken into account.

Students' cognitive activity is affected by the following three groups of factors: organizational, psychological and pedagogical. We included such factors as the level of pre-university training and the status of the teaching-and-educational process within the higher educational system itself into the group

of the organizational factors.

1.2. Research Focus

Varying levels of pre-university training are mostly tangible during the period of adaptation to a higher educational institution. Pre-university training incorporates a wide range of educational services, such as attending preliminary courses where a secondary school student gets familiarized with the educational profile of interest. During the adaptation to a higher educational institution lots of students feel the need to close their school learning gaps, to get used to the new training system, and get acquainted with the higher educational institution, its departments and the chosen field of study. A student's inability to fix their school learning gaps by themselves results in their expulsion that reaches the average rate of 9.2% in the first year of study (Bakhaeva, 2010).

We included the regional needs of the labour market in the organizational factors. The students need to be competent and competitive with the regional specialists, which positively motivates them in their subsequent education. The graduate employment rate is presently used as a university competitiveness criterion (Merzon *et al.*, 2015). An employer is interested in a professionally competent graduate, able to think outside the box in a dynamic environment, work in a team, make measured and competent decisions and be communicative (Sozontova *et al.*, 2015; Sattarova, and Gabidullina, 2015; Falyakhov and Shatunova, 2015; Korableva and Kalimullina, 2014; Korableva *et al.*, 2017a).

We included the following into the group of psychological factors: student intellectual abilities, motivation for cognitive activity, intra-group student-student and student-teacher relations.

We referred the following to the group of pedagogical factors: a set of traditional and innovative modes of study; a combination of various academic performance assessment methods; a combination of the in-class and out-of-class work (Osadchy and Akhmetshin, 2015b; Askhamov *et al.*, 2016; Korilova and Magsumov, 2017; Korableva *et al.*, 2017b; Gabidullina and Sattarova, 2015).

The educational process becomes interesting for a student from that very moment when they are provided with an opportunity to express their own judgment, analyze their friends' answers, review scientific works, and get into discussions with teachers (Morova and Grunina, 2007). A sustained interest to the future profession will only be formed if a student has their own world-view, idea of the profession and of their role in it, and if the student is able to produce independent judgments and apply a creative approach (Osadchy and Akhmetshin, 2015a; Ibatova *et al.*, 2016; Gabidullina, and Khaliullina, 2017).

The introduction of unconventional professional tasks and problems for the development of independent thinking enables to master the methods of analysis and synthesis, learn how to compare and generalize, identify links between objects, phenomena and events in the professional activity (Akhmetov *et al.*, 2015; Sedov, 2015; Korableva and Kalimullina, 2016; Magsumov, 2014).

2. Methodology of Research

2.1. General Background of Research

Analysis of the scientific literature has made it possible to determine three levels of cognitive activity: reproductive, partially exploratory and research.

To research the dynamics of university students' cognitive activity in the educational process there were developed criteria to measure the students' cognitive activity.

To measure the students' cognitive activity level within the educational process there were developed the students' cognitive activity measurement criteria. The criteria are as follows: attitude to the object of cognition, focus of learning and question formulation mindset and search of the modes of action. Cognitive activity development levels are the following: reproductive, partially exploratory and research (Bakhaeva, 2010).

To study self-assessment of professional competence by a student seeking a bachelor's degree we used a questionnaire that enables to determine the following indicators:

- knowledge of the object of professional activity;
- knowledge of the operating procedures applicable in the field of the future profession;
- knowledge of special features of work in their future professional activity, knowledge of the theoretical bases for their professional activity;

- diagnosing the level of professional competence development;
- knowledge of technology for their professional activity;
- ability to use research methods, knowledge of scientific achievements in the field of professional activity, of the legal framework and documentation;
- ability to generalize one’s own experience;
- knowledge of methods and ways of self-education.

A research has been made on the basis of two higher educational establishments. The students of the University of Management of Tatar Institute of Business Cooperation (UMTIBC) and Elabuga Institute of Kazan Federal University (EI KFU) took part in the experiment. Among the participants were first- and fourth-year students of the Bachelor’s Degree Courses. The number of students is shown in Table 1.

Table 1
Number of 1 and 4 Bachelor’s Degree Courses Students Who Participated in the Experiment*

Higher Educational Establishment	Number of students
UMTIBC, 1st year students	52
UMTIBC, 4th year students	52
EI KFU, 1st year students	57
EI KFU, 4th year students	57

*The total number of students: 218

3. Sample of research

A one-semester long experiment with 4th year students of two educational establishments was organized to research the influence of cognitive activity on self-assessment of their professional competence.

The hypothesis of the study is that cognitive activity influences the level of professional competence if the following pedagogical conditions have been created: a conscious attitude of students to the future profession has been formed, their cognitive activity aimed at acquiring professional competences has been accelerated; a program for the development of cognitive activity as a factor for forming students’ professional competence has been created within the framework of which the object of the would-be specialist’s activity is intensively studied; the modular and rating system for training quality assessment is used.

The formative stage of the experiment was conducted with the students as an optional 2-hour a week course on the basis of the facilities of UMTIBC and EI KFU under the “Program for Development of Students’ Cognitive Activity as a Professional Competence Forming Factor”. The total number of hours under this program was 36.

The following aspects were analyzed in the course of students’ studying process: a focus on enhancement of the students’ cognitive activity, a desire to do work well, regularity of homework completion and students’ independence level.

The underlying assumption of our work was that the training quality assessment system should facilitate regular and focused work of the students, make it possible to constantly monitor student academic performance, and, at the same time, to enable the students to monitor their achievements, thus causing the transfer of the student to a higher level of cognitive activity (Choshanov, 1996; Ganeev and Ganeeva, 2015).

The syllabus of “Program for Forming Professional Competence of Would-Be Specialists” Course is represented in Table 2.

Table 2
Syllabus of “Program for the Development of Cognitive Activity as a Factor for Forming Students’ Professional Competence of the Would-be Specialists”

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	knowledge of the object of professional activity	Mastering the methods of work in the area of future profession	professional activity, knowledge of theoretical bases of professional activity	diagnosing the development level of professional competence	knowledge of the professional activity technology	achievements in the field of professional activity, of the legal framework and documentation	ability to generalize one's own experience	knowledge of methods and ways of self-education
Students' cognitive activity level	0.4	0.6*	0.3	0.2	0.7*	0.5*	0.4*	0.6*

Note: * – Correlation between A and B is statistically important for the level $p=0.01$.

The undertaken analysis uncovered a correlation between the students' cognitive activity and the knowledge of methods of work in the sphere of future profession; knowledge of the professional activity technology; knowledge of methods of the research work, knowledge of scientific achievements in the field of professional activity, of the legal framework and documentation; ability to generalize one's own experience; knowledge of methods and ways of self-education.

The analysis of average group values of the first- and fourth-year students' cognitive activity shows a general trend of ongoing changes caused by the educative process in the higher educational establishment (Table 5).

Table 5
Cognitive Activity Levels Development Dynamics

HEE	Levels of the cognitive activity development		
	Reproductive	Partly Exploratory	Research
UMTIBC, 1 year	48	48.2	3.8
UMTIBC, 4 year	34.4	50.7	14.9
EI KFU, 1 year	43.8	52.7	3.5
EI KFU, 4 year	38.6	51.7	12.2

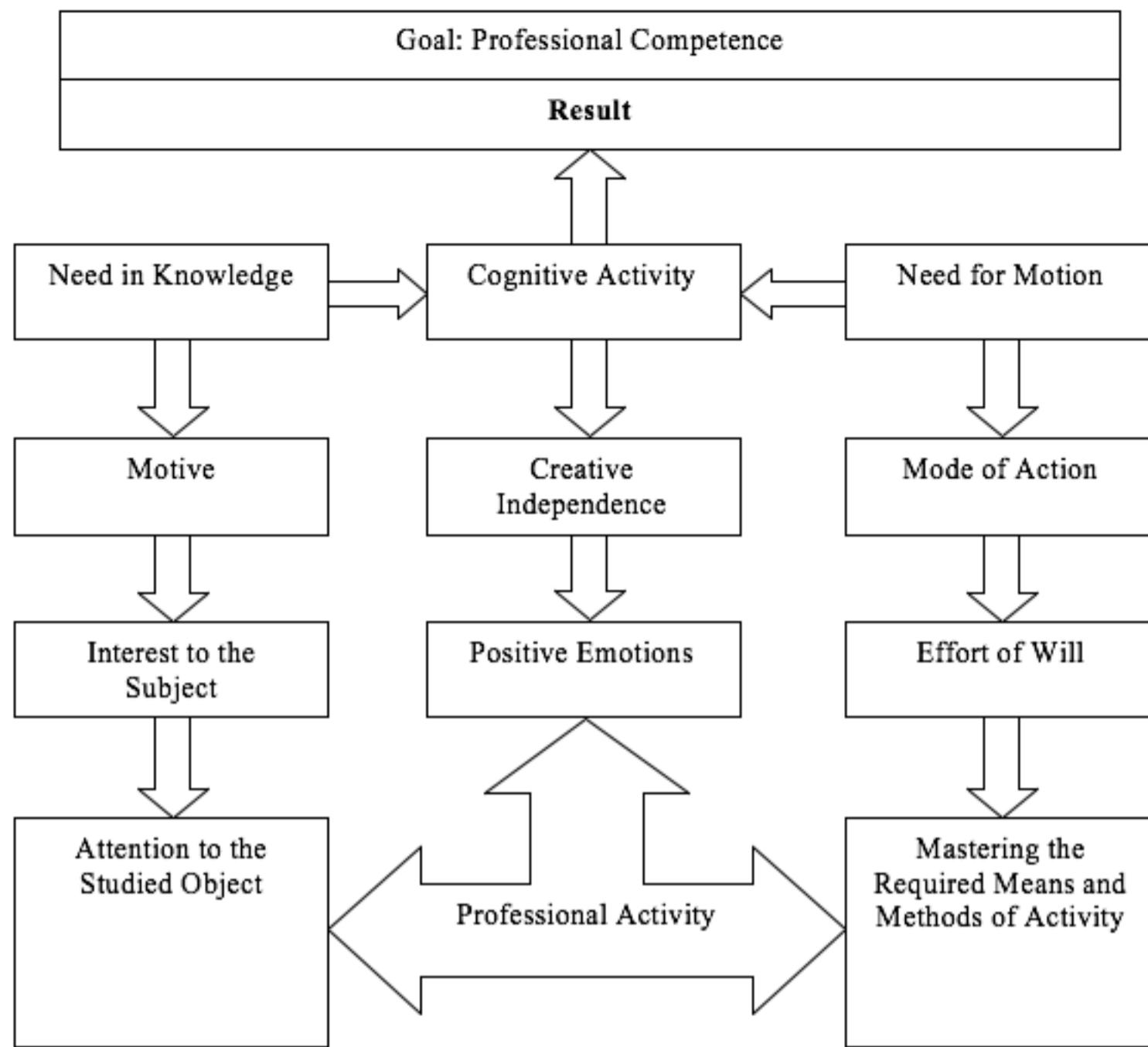
The organization of a system for boosting cognitive activity in the educative process of the higher educational establishments resulted in a significant rise in the number of students with a research level of cognitive activity (14.9%; 12.2%) and a significant decrease in the number of students with a reproductive level (34.4%; 38.6%).

4. Data Analysis

The studies by L.P. Aristova, L.I. Bozhovich, N.F. Dobrynin, A.N. Leontyev, A.A. Smirnov and others for defining the notion of cognitive activity show a close connection between innate readiness of a personality for intellectual activity and intensive manifestation of that readiness.

The theoretical analysis of scientific literature in the research problem (Tararina et al., 2015) enabled us to elaborate the cognitive activity development mechanism that forms and develops the students' professional competence and that includes the following components (Figure 1).

Figure 1
Mechanism of formation of the bachelors' cognitive activity in the professional competence structure (Bakhaeva, 2010)



The cognitive activity development mechanism created by us allows to define pedagogical conditions required for forming professional competence of the would-be bachelors:

- creating a conscientious attitude to knowledge acquisition in the higher educational establishment’s educative process based on the development of student cognitive activity;
- creating a model of future professional activity in the course of studying in the higher educational establishment, where the object is “approximated” to a student and where there exists a direct possibility to intensively build professional competences and study of the specificity of labor;
- application of different variable education quality assessment forms, including a module rating system.

Thus, we consider cognitive activity to be a process of cognition that is intellectual and emotional in nature, a manifestation of interest and aptitude for learning, completion of tasks, a need for practical and intellectual activities that define the dynamics of professional competences. Existence of cognitive activity becomes a mechanism for successful mastering of the curriculum; it characterizes effective organization of the educational process in a higher educational establishment, while its lack is indicative of shortcomings in the organization of the training process.

Because of the study undertaken by us, we have obtained a positive dynamics of the undergraduate students’ cognitive activity and professional competence, defined the mechanism of the cognitive activity influence on the students’ professional competence, and determined pedagogical conditions ensuring such influence.

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References

Abulkhanova-Slavskaya, K. A. (1989). The activity and consciousness of the person as the subject of activity. The psychology of the individual in socialist society: activity and personal development. Moscow:

Nauka.

Afanasiev, V. V. (1996). Formation of student creative activity in the process of solving mathematical problems (Monograph). Yaroslavl: K.D.Ushinsky Yaroslavl State Pedagogical University.

Akhmetov, L. G., Fajzrakhmanov, I. M., & Fajzrakhmanova, A. L. (2015). Features of use of direct communicative interaction in the course of formation of professionally significant competence. Paper presented at the Interdisciplinary Behavior and Social Sciences - Proceedings of the 3rd International Congress on Interdisciplinary Behavior and Social Sciences, ICIBSoS 2014, 117-120.

Askhamov, A. A., Konysheva, A. V., & Gapsalamov, A. R. (2016). Use of E-resources of the learning environment in teaching mathematics to future engineers. *International Journal of Environmental and Science Education*, 11(5), 673-684. doi:10.12973/ijese.2016.340a

Bakhayeva, T. N. (2010). Research of interrelation of informative activity and professional competence of students of higher education institutions. *Education and self-development*. 1(17), 103-108.

Bochkareva, T. N. & Bakhaeva, G. M. (2014). The relationship of cognitive activity and professional competence of university students. *Scientific Review, Scientific Journal*, 9 (1), 289-291.

Choshanov, M. A. (1996). Flexible problem-and-modular teaching technology (Methodological guide). Moscow: Narodnoe obrazovanie.

Choshanov, M. A. (1997). Didactic design of a flexible teaching technology. *Pedagogika*, 2, 21-29.

Falyakhov, I. I., & Shatunova, O. V. (2015). Formation of the social-professional mobility of students during their participation in the college innovative activity. *Social Sciences (Pakistan)*, 10(6), 926-929.

Gabidullina F.I. (2014). Religious motives in the work of Sagit Sunchalay and Anna Akhmatova. *Recent Trends in Social and Behaviour Sciences - Proceedings of the 2nd International Congress on Interdisciplinary Behavior and Social Sciences 2013, ICIBSoS 2013*. pp: 475 - 477.

Gabidullina, F.I., Sattarova, G.G. (2015) Reflects the traditions in contemporary prose. *Mediterranean Journal of Social Sciences*. Vol 6, No 5, pp.: 201 - 203. DOI: 10.5901/mjss.2015.v6n5s2p201

Gabidullina, F.I., Khaliullina, A.G. (2017). Islam motives in Sagit Suncheley's works. *Man in India*. Volume: No.97, Issue No.:10, Pp : 211-216

Gabidullina, F., Minnullina, R., Nureyeva, A. (2017). The concept of the character in the novels of Gayaz Ishaki. *Man in India*. No.97, Issue No. :10, Pp : 177-182

Ganeev, R. M., & Ganeeva, A. R. (2015). Organization of independent work on mathematics among the students of biological department at university using information technologies. *Research Journal of Applied Sciences*, 10(10), 648-652. doi:10.3923/rjasci.2015.648.652

Ibatova, A.Z., Ippolitova, N.V., Muchametgaliyeva, S.K., Rodionova, A.E., Yagafarova, K.N., Ikonnikova, L.N. (2016) Lifelong professional education in the Russian federation: Personal aspect. *International Journal of Environmental & Science Education*, 11(16), 9426-9436.

Korableva O., Kalimullina O. (2014). The Formation of a single legal space as a prerequisite for overcoming systemic risk. *Asian Social Science*, Vol. 10 (21), 256-260.

Korableva O., Kalimullina O. (2016). Strategic Approach to the Optimization of Organization Based on the BSC SWOT Matrix. *Proceedings of the International Conference on Knowledge Engineering and Applications*. ICKEA, 2016. Singapore, September 28-30, 2016. p. 212-215

Korableva O. N., Kalimullina O. V., Kurbanova E.S. (2017a). Building the monitoring systems for complex distributed systems: Problems & solutions. *ICEIS 2017 - Proceedings of the 19th International Conference on Enterprise Information Systems*, Portugal, Porto, 26-29 April 2017, pp 221-228.

Korableva O. N., Razumova I. A., Kalimullina O. V. (2017b). Research of Innovation Cycles and the Peculiarities Associated with the Innovations Life Cycle Stages. *Proceedings of 29th IBIMA Conference*, Vienna, Austria, 3 - 4 May 2017, pp 1853-1862.

Korilova, I.V., Magsumov, T.A. (2017) Emancipation in educational system: Formation of women's higher education in Russia. *European Journal of Contemporary Education*. (2), 6: 352-366. DOI: [10.13187/ejced.2017.2.352](https://doi.org/10.13187/ejced.2017.2.352)

Lerner, I. I. (1986). Chapter 5: The composition and structure of educational content on the theoretical plane. *Soviet Education*, 28(8-9), 91-120. doi:10.2753/RES1060-939328080991

Lytkina, N. L., Timofeeva, A. N. (2010). The modern view of human resource management in the field of socio-cultural service. *Vocational education*, 9, 12-13.

Magsumov, T.A. (2014) Main approaches to the study of historical and educational process. *Bylye Gody*. (4), 34: 720-726.

Merzon, E. E., Fayzullina, A. R., Ibatullin, R. R., Krylov, D. A., Schepkina, N. K., Pavlushkina, T. V., & Khairullina, E. R. (2015). Organizational and pedagogical conditions of academic mobility development of students at school of higher professional education. *Review of European Studies*, 7(1), 46-51. doi:10.5539/res.v7n1p46

Morova, N. S. and Grunina S. O. (2007). Formation of students' social activity in the conditions of educative system of a pedagogical higher educational institution (Monograph). Yoshkar-Ola: N.K.Krupskaya Mariysky State Pedagogical Institute.

Osadchy, E. A., & Akhmetshin, E. M. (2015a). Integration of industrial and educational sphere in modernization of economic relations. *Journal of Applied Economic Sciences*, 10(5).

Osadchy, E. A., & Akhmetshin, E. M. (2015b). The intellectual capital importance and the role of organizations against the backdrop of a crisis: Innovation vector. *Social Sciences (Pakistan)*, 10(6), 1013-1020.

Polovnikova, N.A. (1975). Methodological issues of the method of cognitive activity. *Education of cognitive activity and independence of students*, 144, 102.

Sattarova, G.G., Gabidullina, F.I. (2015). The novel's genre of the modern Tatar literature (in the example of the F.Bairamova's creation). *Journal of Language and Literature* . ISSN: 2078-0303, Vol. 6. No. 2. Iss.2, May, 2015

Sedov, S. A. (2015). Formation of the individual's technological culture in general education and professional school. *Mediterranean Journal of Social Sciences*, 6(4S1), 71-75. doi:10.5901/mjss.2015.v6n4s1p71

Sozontova, E. A., Gilmullin, M. F., & Anisimova, T. I. (2015). The development of readiness for labor among the bachelors with pedagogical education. *Social Sciences (Pakistan)*, 10(7), 1743-1746. doi:10.3923/sscience.2015.1743.1746

Tararina, L. I., Sokolova, E. I., Akhmetov, L. G., Faizrakhmanov, I. M., Yakovlev, S. P., Kozhanova, T. M., & Khasanova, G. B. (2015). Implementation of the multicomponent algorithm of the interdisciplinary teaching modules into liberal education of the university students. *Mediterranean Journal of Social Sciences*, 6(2S3) doi:10.5901/mjss.2015.v6n2s3p196

Yurkovets, O.A. (2008). Formation of professional competences based on the application of modular competency training technology in secondary professional education. *Teacher Education and Science*, 6, 24-26.

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