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Formationof Graduates'Professional Competence in Terms of Interaction Between Educational Environment and Production

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ABSTRACT

The relevance of the professional competence creation problem declared in the article that complies with current time requirements and specialists, first of all requires facilitation of interaction of the central education chain – the educational institution, with production (that is the personnel's consumer). Thus the problem of organic combination of society's requirements and production, with the level of professional school development, becomes very important. The aim of the article lays within the definition of technical profile competitive specialists' training conditions, with quality formed professional competencies as part of "production" – "educational institution" interaction. In Russian and worldwide pedagogics has a lot of experience in researching issues related to competitiveness and competencies creation. Many famous scientists developed various aspects of educational organizations competitiveness problem and questions of integration in pedagogics. The method of modeling of creating conditions and professional competencies development that allows to overview this issue as a holistic pedagogical process and provides an effective way to train competent, competitive professionals with high level of professional competence is the chief method to discover this issue. The structure of presented competent specialists training system includes targeting, methodological, substantial, organizational-procedural and resultative components and allowed us: to analyze the state of the problem on the current stage of pedagogics and, according to this base, to disclose the organizational-pedagogical conditions of the competitive and competent specialists training; systematize the compound and the system of securing and developing specialist's competitiveness and for the production within the vocational school. System is directed to the integration of specialists' theoretical and professional-production training, where its professional competence formation, development and evolution is happening. The realization of these conditions allows to significantly reduce the adaptive period of young specialist's entry into the manufacture production process. The presented system has the practical value for the vocational educational institutions during training of qualified workers and employees as well as mid-level professionals.

KEYWORDS
Competency, competitiveness, production, professional institution, professional competency, system

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Introduction

The modern system of specialists' training for the production requires attention from the pedagogical researches, because of the rapidly changing of the production and educational technologies, and raising the demand for high quality graduates of vocational institutions.

In series of early researches within the vocational education the questions related to the integration as a pedagogical phenomenon (Chapaev, 2005), interdisciplinary relations as one of the ways for education integration (Maximova, 1984), interdisciplinary connections as unity of general and special technical education (Ivanov, 2005) were explored.

Questions of theory and construction methodology of educational process in the middle vocational school, that assisted with the training of competitive and professionally mobile specialists, were highlighted in the K.K. Mukminshin's (2004) thesis research.

For a long time, educational process within the professional education system was being built according to the deductive basis under the deductive triad: "knowledge, abilities, skills", at what the basic attention is devoted to the knowledge mastering. The longstanding practice discovered the essential defects of such approach, in particular: within the knowledge paradigm problem the gap between the knowledge and the abilities to use it never stopped being relevant (Levistkaya, 2010).

N.K. Nuriev (2005) thinks, that the basic feature of a vocational educational institution graduate is his efficiency to solve any problems, that are connected to support, organize and create innovations in the area of his competence, with the release of innovational (material and information) product. Competent specialist, is a professional that qualifies to these requirements. The competent specialist is relevant in society today, because he carries primary weight and responsibility for the progressive renovation of the society's whole infrastructure in general (Nuriev, 2005).

Among the recent researches, one of the interesting studies is E.M. Gabitova's (2015) work that explores trans-professional competencies creating, from the position of competent technical profile specialists' training.

At the same time the literature analysis showed, that at present time there are no studies, that reflect objective fundaments and factors of educational process enhancement, from the stand point of specialists' professional competence creation, and development, from the point of external (productive) environment and internal (educational) environment interaction.

Materials and Methods

In the research process the analysis of the normative documents and the products of scientific activity was conducted. Prognostication, systematization and summarizing of facts and concepts; modeling, projection and also the analysis of the learners' activity results for the professional competency formation, the studying and summarizing the technical profile specialists' experience formation and professional competency formation, their readiness to perform their working functions, prescribed in the professional standards were performed.

At the first, preparatory stage, the current condition of the examined problem within the pedagogical theory and practice was analyzed; the methodology research program was developed.

At the second, primary stage, the system of technical profile teachers' professional competency for pedagogical activity realization, in current conditions of educational institution and production interaction, was developed and implemented; the effectiveness of presented system examination research work was conducted.

At the third, final stage, research results' systematization, conception and summarizing were accomplished; theoretical conclusions were specified; the derived research results processing and execution were accomplished.

Results

As a research result, the earlier stated contradictions: between integral human (student) nature and strong differential preparation system of a specialist, that was conducted by a scaled integrational work and the absence of appropriate effect, were discovered (Asadullin, Vasilyev & Ivanov, 2010).

The analysis of scientific activity products showed, the problems of the scientific possibilities of educational process' formation within the vocational school with the highly qualified specialists' training, in which, generally deducted, integrational patterns were examined from the point of their functioning in the specific educational field - are least developed. In particular, in the professional educational institution formation and the development process at the current stage of pedagogics, with taking in consideration the cumulative local (in Russian Federation) and global experience of integration between professional education and production.

Transformations, that are taking place in our society, led to lots of changes in the vocational education system, but the extant contradictions between the production requirements with the qualified labor force and qualitative level of young specialists' preparation, that overflow as an indicator of the effectiveness and competitiveness of the educational institution, showed insufficient development of this problem and allowed to reveal and present the aspects line of the organizationally-pedagogical and economic directions of its development.

By the founders of the Russian professional education's concept the following requirements to Russian vocational education system and containment were stated: correspondence to the requirements, competitiveness of the trained employees, the polytypic and various professional school character depending on: initial general education, combination of general and specific within the education content (Ivanov, 1999), education's practical direction and efficient specialization, gradual exchange of the apprenticeship by the occupation schools, combination of the labor and teenage-employees apprenticeship with the night-schools education, etc. (Menshikov, 2012)

At the soviet period of the professional school development personnel training and the vocational school development proceeded in a complex sociopolitical conditions. Ideological and socioeconomic factors had a material effect on it. Pedagogic science was put in a strict governmental limits (Gololobov & Ivanov, 2005).

The possibility of the future structural changes showed the creation and scientific ground for innovational activity types of vocational school – the higher

vocational, technical and professional colleges and lyceums, educational complexes "school – technical training college", "technical training college – technical school", farmers' school, etc., that received a large development in Russian Federation.

As the realisation of our professional education modernization program monitoring have shown, today we again are on the stage of creating a complexes (mentioned above), just in the modern interpretation.

On account of the uttered, educational institutions in the field of specialists' training also must navigate to the international level of competitiveness in some cases or necessarily should follow it in other cases (Umrukhin, 1997). In the Russian labor market, the factor, that is connected to the market economy development, made changes of the quantity as well as the quality of the labor force requirement. It happened not only because of the structural changes within the production, but also because of the institutional changes line: the cancellation of the young specialists' obligatory allocation, the accommodation market formation, the registration function minimization – expanded the possibilities of job selection.

As a research result we made a conclusion, that educational system forms and reveals its behavior only when external and internal environments interact. Internal environment reacts on the impact of the external environment, developing itself upon this impact, but at the same time it keeps the qualitative distinctness and behavior, that provides the comparative constancy and system functioning adaptability.

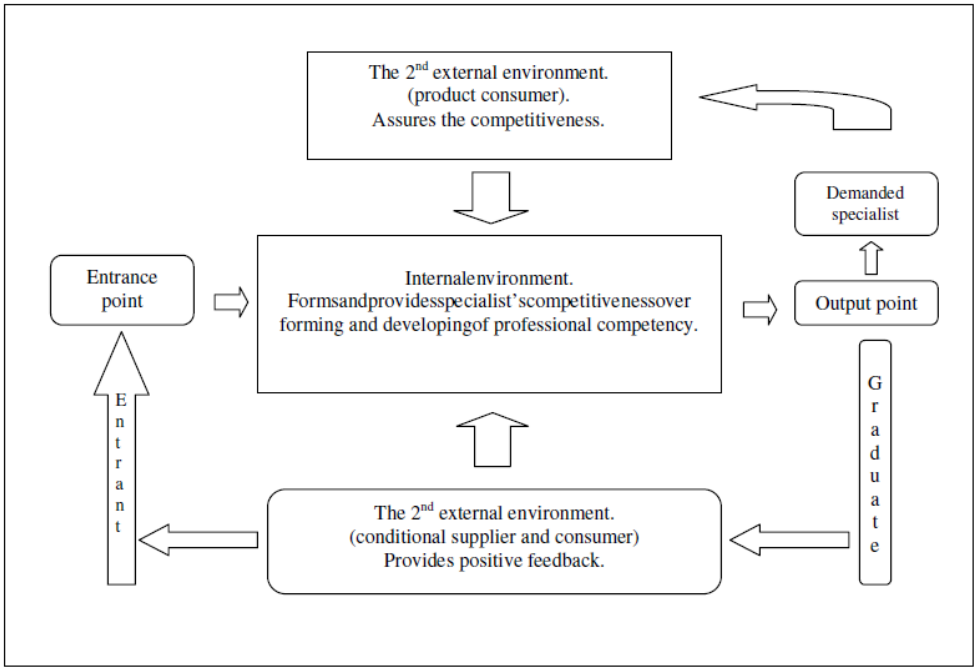

Figure 1. The formation and specialist competitiveness assurance system.

Without the interaction with the 2nd external environment (see picture above), educational institution cannot provide graduates' professional competency and their competitiveness creation and development. Without the interaction with the 1st external environment – the existence of the educational institution is completely

impossible. Our research shows, that if both 1st and 2nd external environments have less indignations, then educational institution functioning is more stable. So, the task of pedagogical management consists in prognostication the situations and taking action for system parameters adaptation to the external environment factors.

On application of the system approach to the educational institution competitiveness research, mainly on the basis of marketing, the "entry" and "exit" parameters of external environment are being formed. What specialists should be trained? What is the level of relevancy? What are the costs? For whom should they be trained? For these questions answers are given based on the analysis and educational institution activity rating within the competitiveness assurance sphere (Nozdreva & Tsygichko, 1991; Porter, 1993). The qualitative and quantitative index at the entrance point depends on the external image of the educational institution, and the same index at the output depends on the internal environment factors. The more graduates are transferred from the internal to the 2nd external environment, the higher the educational institution's competitiveness index and more university entrants there are at the internal environment entrance point.

At the entrance point parameters' determination, the most important factors are the resource ones. The resource requirement is being forecasted after the organizational-technical level analysis (of internal environment), the possibilities of their assimilation and requirements' satisfaction. The feedback is a communication channel from the consumers (of external environment) to the educational institution. If the consumers' requirements to the educational institution change and the competitors and relevant specialists appear on the market, the "entrance point" should react to this changes and apply needed changes into the internal environment parameters functioning.

Thereof, the internal environment depends on three basic system elements: "entrance point", "output point" and the 1st external point. And in the same time the most important internal objects, that should be changed, are: organizational-pedagogical level, technical level and their objects and factors, that determine the financial state, and also the factors that provide the education effectiveness; the state of being relevant and educational organization competitiveness consequently.

Our research showed, that for the educational institution graduates competitiveness it is necessary, that:

1) marketing researches assure the accordance of the education to the world-wide attainments, so the qualitative indexes of the specialists training must be competitive. It can be reached because of the "entrance point" and external environment competitiveness, at the same time the "entrance point" competitiveness rating stays behind the 1st external environment;

2) the internal environment "entrance point" must provide the competitive specialists training. If the "entrance point" includes various kinds of resources and methods, projects and "know-hows", so it should be complied to the global standards. It is possible, if the external environment (market, production, investors, etc.) has the required maturity;

3) the 1st external environment is interested in the educational organization development and assisted the internal environment processes standard course; an important significance here has the 2nd external environment politics of competitiveness;

4) the system's internal environment must be able to adapt to the entrance point and to the external environment in general; if we consider the internal environment as an educational process (of educational institution) with all required elements (organizational-pedagogical, financial-economical, informational-technological, personnel), and the 1st external environment as public authorities (taxation, credit, legislative), we should systematically explore the factors of their interactions and influences to the educational institution competitiveness formation and graduates' professional competency formation. And this is possible on the basis of structural, specifically-purposed continuous analysis and synthesis.

Structural analysis allows to research the constellation of elements and components of external and internal environments within the interaction based on their decomposition, integration and modelling.

The multi connectional system allows to structure the interaction constellation based on integration and modelling. The internal environment interacts with the 1st external environment and develops under this cooperation; and today the main target of pedagogical management of educational institution is forecasting basic situations and undertaking the adaptation to the 2nd external environment factors.

After the research we analyzed the quantity of the students, that possess the critical, reproductive, productive and creative level of professional competency shape, depending on their orientation to the employment into the 1st external environment. And at the same time every one of them were in the same education conditions. The results of this analysis can be found in the Table 1.

Conducting the qualitative analysis of the graduates' vocational competency completeness condition we can take into account, that productive and creative levels are peculiar to graduates, that are oriented for the further employment into the 2nd external environment. The comparative data analysis reveals the positive influence of the professional certainty on graduates' professional competency creation, that are in the comparative group, where they are compared to the graduates from group B.

In the basis of the final index calculation lies the competence comparison of graduates' professional. The rating index serves as high quality graduates' training figure, and the "relevant specialist/graduate" correlation serves as an educational system (institution) competitiveness index and its relevance by the 1st external environment.

The analysis of the research results showed, that the future specialist's professional competence formation as a result of his professional activity mastering provides the organization of his interaction not only with the specific sociocultural and vocational internal environment, but also beyond its bounds – with the 2nd external environment. The orientation of the system's educational process only to the 1st external environment may cause the graduate's alienation from the reality when the choice of the production sphere is being made. At the same time interaction only with the 2nd external environment leads to the point, when future specialist loses his one-dimensionality and internal stability. It creates the serious threat for the graduate's successful professional adaptation and noticeably lowers his competitiveness. This means one thing – that the system must be open.

Table 1. The comparative data of the graduates' competence shape levels – depending on the interaction with the 2nd external environment. (A – oriented on employment within the 2nd external environment; B – not oriented on employment within the 2nd external environment)

Competencies	General competencies		Professional competencies based on the basic kinds of professional activities:							
			Constructive - technological activity on the technician level		Production-technological activity in the limits of structural subdivision		Organizational-management activity on the level of structural subdivision as an initial administration link		Work execution based on one or several workers' professions, employees' appointments	
Levels	A	B	A	B	A	B	A	B	A	B
Critical	7,7	8,6	3,8	5,6	5,6	8,1	3,9	6,3	4,0	4,4
Reproductive (low)	14,4	16,8	10,6	21,9	17,6	19,4	11,9	24,4	15,0	50,6
Productive (average)	59,3	57,9	21,8	20,6	28,9	42,4	26,3	39,4	50,0	45,0
Creative (high)	18,6	16,7	63,8	51,9	41,9	30,1	57,9	29,9	31	-

Discussions

Native and worldwide pedagogics has sufficient experience of education quality's problem research in the vocational education institutions. Important investment into the education and production integration's quality problems development (Atutov, 1986; Batyshev, 1994; Bilgin & Aykac, 2016; Dyakov, 1997; Celik, Akin, & Saricam, 2014; Makhmutov, 1985; Kartal, 2016; Mukhamedyarov, 1997; Ozdemir, 2015; Coladryn, 2002), quality and competitiveness of the vocational school were introduced by specified treatises of the Russian scientists, that were devoted to the educational theory and practice of vocational school (Okrepilov, 1997; Sosonko & Anisimov, 2002; Shishov, 2000). The educational environment projection technologies are described as the quality basis of the specialists' professional training, students' and learners' from colleges basic and professional competencies formation technologies and also competency-oriented completeness level of education results rating technologies. The author's: concept, model and technical HSEI students' vocational competence formation - are being revealed in details (Grebyonkina, 2012). An integral approach in the competency development (Sundburg, 2001). Upon the earlier conducted results, we may state, that the results of many studies remained on paper, and that the concerned aspect wasn't considered in the previous examinations.

Conclusion

On the assumption of the conducted research results, we can state, that our assumption about professional distinctness at the entrance point of the system assisting the formation of higher level professional competencies, appear as a determinant of future specialist's educational-vocational and personal changes.

Our research allowed to reveal the problem, connected with the low level of administrative competencies development within the vocational educational institutions employees in the quality management sphere, and also psychological-pedagogical magisterial structure's insufficient qualification. The absence of complete solution of this problem leads to the preservation of educational process' traditional orientation for assurance of primarily "knowledgeable" component in the graduates' training and limiting the teacher's possibilities of choices of the modern forms, methods, tools and educational technologies. Thus the suspense of the named problem doesn't assist with the innovational transformation realization in the vocational educational institution.

Recommendations

The research results may be useful for the foundation of the teachers, with engineering education, professional retraining using the "Education and pedagogics" course.

The introduced system has a practical value for the vocational educational institutions during the training of specialists using the "qualified specialists and workers training program" as well as "mid-level professional training program".

Study is also recommended to scientists and higher vocational and middle vocational school teachers, who work on solving the problem of the future technical profile specialists' professional competence creation.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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