



## **Didactic Possibilities of Formation of University Students Professionally Significant Personal Qualities**

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### **ABSTRACT**

The modern society needs highly educated professionals, who are not only capable of navigating in difficult work situations, working in a team and taking responsibility for the completed tasks' results, but also willing to take decisions under conditions of frequent change of professional activities' technologies. The goal of the article is to justify and experimentally verify didactic possibilities of formation of future specialists' professionally significant personal qualities in the process of students' professional modules mastering. The leading approach is a design approach that contributes to organization of a focused process for the development of professionally significant personal qualities and the formation of students' competencies, as well as realizing of professional modules' potential in the educational process. The authors reveal, justify and experimentally check up didactic possibilities that contribute to the project approach's effective implementation in the organization of educational process at the university. This article is recommended for teachers, researchers, heads of educational institutions engaged in training of bachelors and masters.

**Keywords:** Higher Education, Project Approach, Professional Modules, Didactic Possibilities

**JEL Classifications:** A23, I23, I26

## **1. INTRODUCTION**

### **1.1. Background**

Modernization of higher education in rapidly developing socio-economic conditions implies a systematic reforming of future specialists' professional training. The modern society needs highly educated professionals, who are not only capable of navigating in difficult work situations, work in a team and take responsibility for the results of completed tasks, but also willing to make decisions under conditions of frequent change in technology of professional activities.

The strategic goal of Russian education is the provision of qualitative education services to promote the harmonious development of each individual. Therefore, in order to train a

competent specialist, one should use effective forms and methods of educational process organization (Barabanova and Ivanov, 2012; Irismetov et al., 2013).

In the context of the increasing globalization of all spheres of the existing reality, the most important feature of pedagogical science is the realization of the paradigm of the design approach to the educational process that is recognized by many researchers (Belkin, 2004; Semenov, 2009; Khairullina et al., 2016; Masalimova et al., 2016). This fact gets reflection in the legislative acts, normative documents in the form of social order on greater attention paying to problems of projecting in pedagogy. The designing is interpreted as one of the leading principles for the projecting of the educational process, a way of its improvement for the realization of the main task - the education of the individual,

development of professionally significant personal qualities, general and professional competencies (Priymak et al., 2015; Tararina et al., 2015).

### 1.2. Status of a Problem

Project approach to the organization and realization of educational process in higher education provides the opportunity for personal development, and conditions' making for its determination and socialization on the basis of vocational, social, cultural and moral values that contribute to the organization of the future professional activity (Polivanova, 2008; Rubtsov, 2002; Aleksandrov et al., 2015).

Problems of formation of professionally significant personal qualities were considered in research (Arestova, 1998; Balter, 2010; Bodrov, 2001; Derkach, 1993; Dmitrieva, 1979; Popov, 2011; Rubinstein, 2002; Ukhtomsky, 2002; Ushinsky, 2005; Shadrikov, 1996; Masalimova and Nigmatov, 2015).

Questions of competence-based approach and competencies are reflected in the works of (Baydenko, 2005; Dneprov, 2006; Zimmaya, 2004; Ibragimov, 2012; Markova, 1996; Mukhametjanova, 2005; Khurlo, 2009; Prokofieva et al., 2015; Shaidullina et al., 2015).

The study of psychological and pedagogical sources shows that a definite scientific and theoretical basis for the further development of the paradigm of the design approach to the educational process has been developed in modern didactics.

### 1.3. The Research Hypothesis

The implementation of the objectives of the educational process organization requires justification and implementation of innovative methodological approaches, their leading ideas and principles, one of which is the project approach, reflecting the integrative project paradigm.

However, all the diversity of the previous research does not solve the problem of the didactic projecting of university students' professionally significant personal qualities' formation and requires its theoretical and practical development.

## 2. MATERIALS AND METHODS

### 2.1. Methods of Research

In the research process the following research methods were used: Theoretical (content analysis of the scientific literature on the problems of the project and competence-based approaches to the educational process; the implementation of the educational potential of professional modules in the educational process); empirical (participant observation, interviewing, questionnaires, interviews, testing, pedagogical experiment); mathematical and statistical processing of research results.

### 2.2. The Basis of the Research

The experimental work was conducted in the period from 2009 to 2014 in the Federal State budget institution "Tomsk Polytechnic University." The ascertaining stage of the experiment included 300 students and the forming stage included 104 students.

### 2.3. The Stages of the Research

The first stage was directed to identify the state of the research problem's development in theory and practice. The analysis of domestic and foreign scientific literature on the problems of project-based approach, data collecting, as well as ascertaining stage's conducting of the pedagogical experiment were carried out. On the second (pilot) stage the new content's approbation was carried out, the problems of implementation of the project approach to the formation of professionally significant personal qualities of university students in the process of professional modules' mastering were studied. The third stage involved the generalization and systematization of the results of the experimental work, a reflection of the obtained results and conclusions' making.

## 3. RESULTS

### 3.1. Project Approach in the Educational Process

A specific scientific and theoretical basis of the problem's development of the project approach to the educational process is revealed which is reflected in numerous studies (Aitov, 2006; Bedov, 2012; Korotaeva, 2007; Matyas, 2000; Rubtsov, 2002; Slobodchikov, 2006; Vlasova et al., 2015).

The analysis of the concept of the project approach to learning process has allowed conclude that, due to its multidimensionality in the scientific literature there is no consensus on its interpretation. The majority of opinions of researchers in this field agree that the project approach in teaching can be seen as an effective means of all-round personality development through independent, focused, productive searching, processing and updating of knowledge in the form of a complex of ongoing projects by the student.

The study of psychological and pedagogical sources showed that there is a certain scientific and theoretical basis for the development of problems of various design approaches to the educational process (project-target, process design, project-oriented, project-modular, design software, project-reflexive, project developmental, etc.).

Through the integration of the most essential points of view and analysis of the results of the study, the following its working definition was formulated.

Project approach to the educational process is a set of conceptual ideas that provides the strategy design of a holistic process of identity's development, formation and development, its general and professional competences on the basis of professionally significant personal qualities.

### 3.2. Modular Curricula of Teachers Training to Implement Project-Based Approach

The authors have developed a specific mechanism of practical application of the technology how to realize the educational potential of the professional modules, namely, they identified educational units of each topic in specific professional modules in the learning process, which do not only allow to build and improve professionally important personal qualities of future specialists and their cultural competence, but also to intensify the whole educational process.

The study showed that the educational potential of professional modules contributes to the students' formation of the scientific world view, true values, social and professional interests, providing their personal self-assertion in modern society, developing need in creativity and teaching them the means of self-organization, autonomy, self-realization and self-development.

### 3.3. Didactic Possibilities of Realization of the Project Approach

On the analysis of psychological and pedagogical literature and experimental data didactic possibilities were revealed: Integration of invariant and variant content of vocational modules; the use of educational technology how to implement project approach; development of a modular curriculum of teachers' training to implement project-based approach, contributing to the formation of professionally significant personal qualities of university students. Identified and justified conditions contribute to the effectiveness of the implementation of the project approach to organization of educational process at the university.

The implementation of the first condition includes the following directions of the research stages: Analysis (definition) of professional and general competencies of students in the field of quality management; the professional competences' and specialists professionally significant personal qualities' conjugation trajectory identification in quality management; determination of the trajectory of professional competence and professionally significant personal qualities' connection of the specialist in the field of quality management of an invariant and variant content of the educational modules.

In the second condition implementing process the pedagogical technology of University students' professionally significant personal qualities' forming on the base of project approach was used. Presented by the authors, the technology represents an optimal combination of its main characteristics (being focused, serialization, process, feedback). The realizing of technology main characteristics' presence in the project process as a process of interaction allowed participants to lift on a new level of self-organization of their own activities.

The implementation of the third condition includes a modular curriculum of teachers' training was developed to implement project-based approach in the educational process. Effectiveness of modular training was evaluated in two units: Innovative-professional and social (personal communication) at each stage of the educational process. As evaluation criteria the social and professional competences were chosen. The conducted scientific study has proved that training of the teaching staff and administration of the university is one of the didactic possibilities for the implementation of project approach in education with the aim of improving of professional and social competencies.

### 3.4. Professionally Important Personal Qualities in the Formation of Competencies

We share the view of some researchers that the competence as the planned learning result cannot be directly formed and measured, therefore it is important to identify indirect external signs

(indicators), in this case professionally important personal qualities with the help of which it is possible to estimate the competences.

Learning results can be divided into two components:

- Cognitive component, which reveals the requirements for learning results and is reflected in the size and content of the knowledge, skills and practical experience of professional modules;
- Activity component, which contains the essential characteristics of each competence of the professional module, external signs (indicators) of the competences' developmental manifestation, which include a set of psycho-physiological, emotional, character personal qualities (professionally significant personal quality), motives, abilities, behaviors' models.

Activity component of the student's formed competence is evaluated on the basis of the results processing of teacher's observations of relevant external signs (indicators), to which the professionally important personal qualities belong, carried out throughout the school year with the help of standardized tests, observation and assessment cards of external signs (indicators).

### 3.5. Didactic Possibilities' Efficiency Criteria of the Project Approach in the Process of Professional Module's Mastering

Standardized tests are used to determine not only knowledge, abilities and skills, but also to assess the level of formation of professionally significant personal qualities of the student. Tests are created in the form of creative tasks (cases with more creative tasks), which allow on a definite case study to teach students to assess the manufacturing situation in general, to use different points of view and to accept in the result a specific decision to solve the problematic situation.

In the beginning of the experiment, at the summative stage, the initial level of students' professionally significant personal qualities' formation was recorded. Systematic monitoring was composed of a radar chart of the dynamics how the students' professionally significant personal qualities were formed in the process of various projects' implementing. The largest shift occurred in such professionally significant personal qualities and peculiarities of students as creativity, creative imagination, aesthetic taste (by 2.9 points); commitment, spatial and rational thinking (by 2.5 points).

In general, multiple indicator growth was observed, characterizing the level of formation of professionally significant personal qualities, which in turn are the basic elements of general and professional competencies.

The level of formation of professionally significant personal qualities of students in the process of professional modules' mastering was checked through integrated qualitative assessment of level of future specialists' competences formation too.

A modular methodology for integrated assessment of competences' development (modules: General; professional) allows comprehensively and objectively: To evaluate the professionally

important personal qualities of a technical designer in the process of professional modules' mastering (creativity, creative imagination, aesthetic taste, activity, adequate perception of criticism, self-discipline, commitment, etc.); to give students and teachers reasonable recommendations for the implementation of the project approach in the educational process.

So at the beginning of the experiment (respondents - students of the first course of March 27 2002 specialty "quality management") the average degree of students' professional competences expression before the experiment was 3.5 points and the average degree of general competencies expression before the experiment was 7.2 points (Table 1).

The most weakly manifested competencies are professional, their average severity during the experiment changed on average by 1.5-2.5 points (Table 2).

The results of the experiment (the same respondents, but the students of the fourth course on March 27, 2002 specialty "quality management") revealed that the most brightly manifested students' competences are general ones, their average rating was hesitated around 8 points. General competences were changed a little 0.3-0.8 points, and some of them were not changed at all.

Statistical processing of data carried out during the summative and formative stages of the experiment (the significance of differences in arithmetic mean for each competency ("Before" and "After")) was assessed with the help of t-test; the significance level was identified with the help of statistical tables.

In general, for many indicators there was an increase that characterized the degree of influence of the students' formed professionally significant personal qualities on the level of general and professional competencies' formation.

#### 4. DISCUSSIONS

In the course of theoretical analysis and experimental work the obtained results and developed on their basis recommendations about project approach implementation to the formation of university students' professionally significant personal qualities in the process of professional modules' mastering do not reveal all aspects of this multifaceted and complex problem. The search for and study of other ways of their forming could be the subject of a further special study.

#### 5. CONCLUSION

The study established that the implementation of the design approach to the formation of students' professionally significant qualities in the process of professional modules' mastering will be effective when the following didactic possibilities are available: Integration of invariant and variant content of vocational modules, contributing to the formation of professionally significant personal qualities of university students; using of educational technology of project approach implementation

**Table 1: Comparative indicators of severity of general competences "Before" and "After" experiment**

Competence	Scores			
	Before	After	Difference	Level of significance
GCC 1	9.5	9.6	0.1	-
GCC 2	8.4	8.6	0.2	-
GCC 3	8.3	8.6	0.3	-
GCC 4	7.7	8.2	0.5	-
GCC 5	7.4	8.1	0.7	0.05
GCC 6	7.6	8.3	0.7	0.05
GCC 7	7.0	7.1	0.1	-
GCC 8	7.1	7.9	0.8	0.05
GCC 9	7.2	7.8	0.6	0.05
GCC 10	9.5	9.5	-	-

**Table 2: Comparative indicators of the degree of professional competences "Before" and "After" experiment**

Competence	Scores			
	Before	After	Difference	Level of significance
PC 1.1	3.2	5.2	2.0	0.01
PC 1.2	3.1	5.3	2.2	0.01
PC 1.3	3.0	5.4	2.1	0.01
PC 2.1	3.3	5.8	2.5	0.01
PC 2.2	3.0	5.9	2.9	0.01
PC 2.3	3.1	5.0	1.9	0.01
PC 2.4	3.3	5.3	2.0	0.01
PC 3.1	3.3	5.8	2.5	0.01
PC 3.2	3.6	4.8	1.2	0.01
PC 3.3	3.3	5.2	1.9	0.01
PC 3.4	3.7	5.7	2.0	0.01
PC 4.1	3.2	5.6	2.4	0.01
PC 4.2	2.6	2.7	0.1	-
PC 4.3	3.6	4.8	1.2	0.01
PC 4.4	3.5	4.5	1.0	0.05
PC 5.1	3.2	4.3	1.1	0.01
PC 5.2	3.1	3.9	0.8	0.05
PC 5.3	3.2	4.2	1.0	0.05
PC 5.4	3.2	5.6	2.4	0.01
PC 6.1	3.0	5.2	2.2	0.01
PC 6.2	5.0	5.8	0.8	0.05
PC 6.3	4.9	5.6	0.7	0.05
PC 6.4	3.8	4.8	1.0	0.05
PC 6.5	3.7	4.2	0.5	0.05
PC 6.6	3.1	5.3	2.2	0.01
PC 6.7	3.2	5.2	2.0	0.01
PC 6.8	3.3	5.8	2.5	0.01
PC 6.9	3.0	5.4	2.1	0.01
PC 6.10	3.0	5.9	2.9	0.01
PC 6.11	3.1	5.0	1.9	0.01
PC 6.12	3.3	5.3	2.0	0.01
PC 6.13	3.5	5.5	2.0	0.01
PC 6.14	3.6	4.8	1.2	0.01
PC 7.1	3.3	5.2	1.9	0.01
PC 7.2	3.2	5.6	2.4	0.01
PC 7.3	3.7	5.7	2.0	0.01
PC 7.4	2.6	2.7	0.1	-
PC 7.5	3.6	4.8	1.2	0.01

which is appropriate to the university students' professionally significant personal qualities' formation in the process of professional modules' mastering; development of teachers' training curriculum to implement project-based approach,

contributing to the formation of professionally significant personal qualities of university students.

## REFERENCES

- Aitov, V.F. (2006), Problem-project approach to the formation of professional competence of foreign-language students. St. Petersburg: Publishing Center of St. Petersburg. p48.
- Aleksandrov, A.Y., Barabanova, S.V., Vereshchak, S.B., Ivanova, O.A., Aleksandrova, Z.A. (2015), Legal basis of free legal aid state system administration in the Russian Federation. *Journal of Sustainable Development*, 8(3), 277-284.
- Arestova, O.N. (1998), Influence of motivation on the structure of goal-setting. *Journal of Higher Education*, 3, 107-111.
- Balter, E.B. (2010), Personal Qualities of the Young Expert as a Competitive Advantage in the Labor Market. Moscow: Scientific notes of Russian State Social University. p32.
- Barabanova, S.V., Ivanov, V.G. (2012), Characteristics of Training and Raising Qualification of Modern Engineering University Faculty: Experience of a Russian National Research University. 15<sup>th</sup> International Conference on Interactive Collaborative Learning, ICL, Code 95312.
- Baydenko, V.I. (2005), Competence Approach to the Design of SES of HPE (Methodological and Methodical Questions). Moscow: Research Center of Problems of Quality of Training. p114.
- Bedov, A.N. (2012), Project approach in the process of revitalization of professional self-determination of teenagers. Moscow: Publishing House Russia. p25.
- Belkin, A.S. (2004), Competence Professionalism Craftsmanship. Yekaterinburg: Ural Publishing House. p171.
- Bodrov, V.A. (2001), Psychology of professional. *Journal of Moscow*, 1, 121-124.
- Derkach, A.A. (1993), Psychology - The Science of How to Achieve the Top of Professionalism. Moscow: Russian Academy of Management. p23.
- Dmitrieva, M.A. (1979), Psychology of work and engineering psychology. *Journal of the Bryansk Institute of Teacher Training*, 2, 224-230.
- Dneprov, E.D. (2006), Education and politics. *Recent Political History of Russian Education*. Moscow: Academia. p536.
- Ibragimov, G.I. (2012), The Concept of Didactic Teacher Training. Kazan: Publishing Center of Kazan. p36.
- Irismetov, A.I., Irismetova, I.I., Shayhiev, I., Ivanov, V.G. (2013), Professional training motivation of future environmental engineers in continuous education system. 16<sup>th</sup> International Conference on Interactive Collaborative Learning, ICL 2013. Kazan: Russian Federation; 25-27 September 2013. p539-541.
- Khairullina, E.R., Makhotkina, L.Y., Kiryakova, A.V., Baranov, V.V., Maksimova, O.G., Khrisanova, E.G., Piralova, O.F., Masalimova, A.R. (2016), The real and the ideal engineer-technologist in the view of employers and educators. *International Review of Management and Marketing*, 6(1), 134-138.
- Khurlo, L. (2009), Theoretical Foundations of Teacher Training to the Development of Student Subjectivity. Moscow: Publishing Center of Education. p383.
- Korotaeva, E.V. (2007), Pedagogical Interaction and Technology. Moscow: Publishing House Academia. p256.
- Markova, A.K. (1996), Psychology Professional. Moscow: Publishing Center of Education. p312.
- Masalimova, A.R., Nigmatov, Z.G. (2015), structural-functional model for corporate training of specialists in carrying out mentoring. *Review of European Studies*, 7(4), 39-48.
- Masalimova, A.R., Porchesku, G.V., Liakhnovitch, T.L. (2016), Linguistic foundation of foreign language listening comprehension. *International Electronic Journal of Mathematics Education*, 11(1), 123-131.
- Matyas, N.V. (2000), Proektny Method of Teaching in the System of Technological Education. Moscow: Publishing Center of Pedagogy. p44.
- Mukhametzjanova, G.V. (2005), Vocational Education: Problems of Quality and Scientific and Methodological Support. Kazan: Publishing Center of Magarif. p319.
- Polivanova, K.N. (2008), Project Activities Students: A Guide for Teachers. Moscow: Publishing Center of Education. p156.
- Popov, Y.A. (2011), Formation of Professionally Important Qualities of Students of Colleges. Moscow: Academy Press. p24.
- Priymak, E., Ivanov, V.G., Barabanova, S.V., Tyurina, N. (2015), Quality Specialist Training in the Context of Technical Regulation System Formation. ASEE Annual Conference and Exposition, Conference Proceedings 122<sup>nd</sup> ASEE Annual Conference and Exposition: Making Value for Society, Code 113020.
- Prokofieva, E.N., Shirnin, A.Y., Smotrin, K.A., Tuisina, G.R., Pavlov, I.V., Tenyukova, G.G., Filina, N.A. (2015), Integrative games as the technique of technical university students' professional competences formation in the field of health and safety. *Mediterranean Journal of Social Sciences*, 6(2S3), 64-70.
- Rubinstein, S.L. (2002), Fundamentals of General Psychology. Moscow: Publishing Center of Education. p510.
- Rubtsov, V.V. (2002), Designing developing the educational environment of the school. *Journal of the World of Education - Education in the World*, 2, 272-276.
- Semenov, V.D. (2009), Interdisciplinary ensure the modernization of vocational education. Design and develop a reflective approach. Moscow: Academia. p247.
- Shadrikov, V.D. (1996), Psychology of Work and the Ability of the Person. Moscow: Publishing Corporation «Logos». p320.
- Shaidullina, A.R., Evsyukova, N.Y., Mikhailov, V.A., Gazizova, F.S., Masalimova, A.R., Khairullina, E.R., Galimzyanova, I.I. (2015), The curriculum project on professional and pedagogical teachers' communication culture formation. *Mediterranean Journal of Social Sciences*, 6(2S3), 202-208.
- Slobodchikov, V.I. (2006), The anthropological meaning of research students. Moscow: Research Center of Problems of Quality of Training. p244.
- 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), 196-201.
- Ukhtomsky, A.A. (2002), Dominant. Articles in different years. 1887-1939. Moscow: Russian Academy of Management. p448.
- Ushinsky, K.D. (2005), Selected Works. Moscow: Publishing Center of Bustard. p541.
- Vlasova, V.K., Kirilova, G.I., Masalimova, A.R. (2015), Information and logistic foundations of pedagogical education design and content education. *Review of European Studies*, 7(4), 54-58.
- Zimnaya, I.A. (2004), Key Competence as Effectively-Targeted Basis of Competence Approach in Education. Moscow: Research Center Challenges the Quality of Training. p20.