

Efficiency of Training of Engineers in the Conditions of Educational Environment Profiling of Technical Higher Education

Elena Mikhailovna Kargina

Department of Foreign Languages
«Penza State University of Architecture and Construction»
Street Titov, 28, 440028 Penza, Russia

Copyright © 2015 Elena Mikhailovna Kargina. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Efficiency of training of engineers in the conditions of educational environment profiling of technical higher education is analyzed. Results of monitoring of experimental data according to criterion of readiness of future engineers for competitive professional activity are presented.

Keywords: training of engineers, educational environment profiling, technical higher education, readiness level, efficiency

1 Introduction

One of efficiency bases of dynamic development of economy and industry of Russia is modernization of activity of technical higher education institution and ensuring quality of training of future engineers with them. The structure and the maintenance of the higher technical education have to answer modern social and economic conditions [1] which realization is aimed at the development of demanded personal characteristics of engineering personnel to which it is possible to carry: competitiveness, social and professional activity, responsibility, mobility, competence and readiness for self-knowledge and self-realization in fields of activity which adequately reflect the opportunities which are available for the person in the conditions of profile engineering education.

2 Experimental study

The concept of profile engineering education assumes updating of structure and content of education, bases of its organization, forms and methods of interaction of participants of educational process that creates prerequisites for emergence of new forms of integration of diversified educational institutions of professional, general and preschool education.

Problem of this research is carrying out monitoring of process efficiency of educational environment profiling at stages of preschool, general and professional education. Process of implementation of research program includes the following stages: stating, forming, productive and estimated and correcting. The purpose of the stating stage of experiment is ascertaining of efficiency degree of educational process realization in the conditions of educational environment profiling and in the conditions of traditional education system.

Experiment was made on the basis of versatile educational complexes (experimental group) and in establishments of the education system (control group) which developed in the region at the levels of preschool, general and professional engineering education [3].

The assessment of efficiency degree of process realization of education in the conditions of educational environment profiling can be made at three fundamental levels: regulatory base; realization of social and pedagogical conditions; readiness of a subject basis of pedagogical process for activity in the conditions of educational environment profiling.

In view of that fact that criteria and indicators of level of regulatory base and level of realization of social and pedagogical conditions are constants, during the stating stage of experiment criteria of efficiency of process realization of the educational environment profiling at the level of readiness of subject basis for the studied process are defined [4].

We will consider degree of efficiency of realization of educational process according to criterion of readiness of pedagogical process participants for activity in the conditions of educational environment profiling (Table 1).

In general, at the time of carrying out the stating experiment stage on studying of realization efficiency of process of educational environment profiling by all criteria it wasn't revealed considerable distinctions between the results received by studying activity of pedagogical process participants of establishments of the traditional educational environment and profile educational institutions.

Proceeding from the results received during stating experiment stage the purpose and problems of the forming stage of skilled and experimental work were defined. The purpose of the forming stage of experiment was realization of model and program based on the Concept of educational environment profiling.

Table 1

The analysis of readiness level of participants of pedagogical process for activity in the conditions of educational environment profiling (the stating stage)

Level of preschool education							
Indicators	Processing level	Control group			Experimental group		
		S	P	T	S	P	T
Motivation of participants of profile educational process	high	+	–	–	+	–	–
	middle	–	+	+	–	+	+
	low	–	–	–	–	–	–
Information saturation of participants of profile educational process	high	–	–	–	–	–	–
	middle	–	–	–	–	–	–
	low	–	+	+	–	+	+
Quality of informative functions development of participants of profile educational process	high	–	–	+	–	–	+
	middle	+	+	–	+	+	–
	low	–	–	–	–	–	–
Level of general education							
Motivation of participants of profile educational process	high	–	–	–	–	–	–
	middle	+	+	+	+	+	+
	low	–	–	–	–	–	–
Formation of abilities of participants of profile pedagogical process on perception and realization of didactically significant information streams	high	–	–	–	–	–	–
	middle	–	–	–	–	–	–
	low	+	+	+	+	+	+
Possibility of intellectual development of participants of the profile educational environment	high	–	–	–	–	–	–
	middle	–	–	–	–	–	+
	low	+	+	+	+	+	–
Personal sense of education in the profile educational environment	high	–	–	–	–	–	–
	middle	+	+	–	+	+	+
	low	–	–	+	–	–	–
Level of professional education							
Motivation and orientation of interaction of participants of profile educational process	high	–	–	–	–	–	–
	middle	–	+	+	–	+	+
	low	+	–	–	+	–	–
Formation of abilities of pedagogical process participants on profiling of the educational environment	high	–	–	–	–	–	–
	middle	–	–	–	–	–	–
	low	+	+	+	+	+	+

Table 1 (Continued):

The analysis of readiness level of participants of pedagogical process for activity in the conditions of educational environment profiling (the stating stage)

Personal sense of vocational training in the profile educational environment	high	–	–	–	–	–	–
	middle	–	+	–	–	+	+
	low	+	–	+	+	–	–
Professional orientation of informatization of profile educational process	high	–	–	–	–	–	–
	middle	–	–	–	–	–	–
	low	+	+	+	+	+	+

Note: S – Students, P – Parents, T – Teachers

Problems of the forming stage of experiment were: implementation of skilled and experimental verification of the program for implementation of the Concept of educational environment profiling; realization of innovative structure and content of interaction of components of regional education system profiling; realization of model of educational environment profiling on the basis of the conditions promoting social pedagogically design within the Concept of educational environment profiling; formation of self-sufficient subject basis of educational environment profiling on the basis of formation of its readiness for activity in the conditions of educational environment profiling.

Realization of conditions of educational environment profiling taking into account a goal and tasks was carried out by us in the course of forming experiment stage on the basis of social and pedagogical design within the Concept of educational environment profiling. Among the leading social and pedagogical projects are: «Integrative continuity of the main stages of professional engineering education», «Realization of the principle of a continuity of preparation in the conditions of versatile educational complex activity», «Complex stage-by-stage system of continuous practical preparation and employment of students of higher technical educational institutions», «Integration of education, science and production for the purpose of coordination of joint activity of technical educational institutions and construction enterprises of Penza on training», etc.

On the basis of the data obtained during the stating stage of experiment the program of readiness formation of subject basis of pedagogical process for activity in the conditions of educational environment profiling is developed. It includes: organization of trainings for parents concerning of educational environment profiling; conversations consultations of parents and children with psychologists, teachers for the purpose of determination of the leading interests, abilities and potential opportunities of children; organization of lecture halls, seminars and trainings for teachers of education profiling questions, etc.

According to the program of research, results of the forming stage of experiment are subject to check and an assessment during a productive and estimated stage of experiment which purpose is determination of compliance of the allocated qualitative characteristics of research Concept.

Results of processing of questioning materials of educational process participants of experimental group show their higher level of readiness for profiling and differ in bigger sensibleness of a role of educational environment profiling in a question of a choice and acquisition of a profession than indicators of control group (Table 2, Figure 1). In the analysis of indicators of control group it is noted considerable changes in comparison with the stating cut.

Table 2
Studying of readiness of educational process participants for activity in the conditions of educational environment profiling

Indicators	Control group			Experimental group		
	Preschool education	General education	Professional education	Preschool education	General education	Professional education
1. Assessment of readiness for profiling	41%	51%	55%	50%	89%	99%
2. Assessment of a role of school in choice of profession	16%	28%	38%	22%	82%	91%
3. Assessment of opportunities of profiling	52%	56%	63%	57%	84%	96%

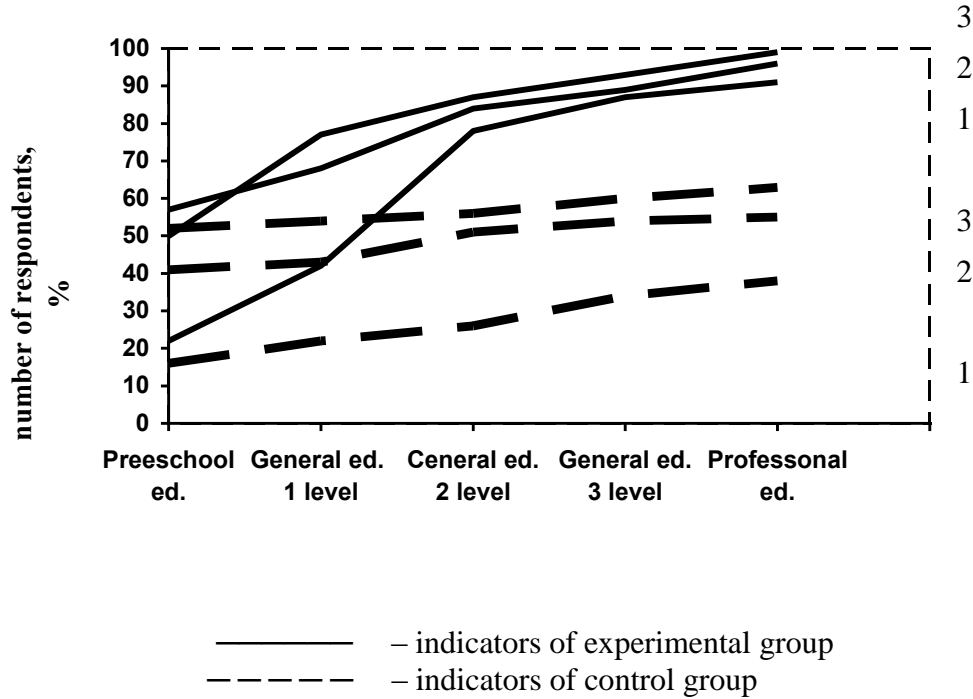


Figure 1. Readiness of participants of educational process for activity in the conditions of educational environment profiling

At determination of coincidence and distinctions reliability for the experimental data measured in a serial scale the following values of criterion χ^2 Pearson

$$\chi^2 = N \cdot M \cdot \sum_{i=1}^L \frac{\left(\frac{n_i}{N} - \frac{m_i}{M}\right)^2}{\frac{n_i}{N} + \frac{m_i}{M}} \quad [5] \text{ were received (Table 3):}$$

Table 3
Empirical values of criterion χ^2 for determination of readiness level of educational process participants for activity in the conditions of educational environment profiling

	Control group before experiment			Experimental group before experiment			Control group after experiment			Experimental group after experiment		
	S	P	T	S	P	T	S	P	T	S	P	T
Control group before experiment	0	0	0	1,8	0,95	4,13	3,1	2,7	4,35	19,1	16,6	34,8

Table 3 (Continued):
Empirical values of criterion χ^2 for determination of readiness level of educational process participants for activity in the conditions of educational environment profiling

Experimental group before experiment	1,8	0,95	4,13	0	0	0	2,4	0,8	9,8	13,9	12,6	15,64
Control group after experiment	3,1	2,7	4,35	2,4	0,8	9,8	0	0	0	18,9	7,25	13,2
Experimental group after experiment	19,1	16,6	34,8	13,9	12,6	15,64	18,9	7,25	13,2	0	0	0

Note: S – Students, P – Parents, T – Teachers

Analyzing these tables, it should be noted that initial conditions of experimental and control groups coincide, and final – differ. Therefore, it is possible to draw a conclusion that the effect of changes is caused by implementation of the developed Concept of profile education.

3 Conclusions

At the correcting stage of experiment the contents of the developed social and pedagogical projects with the purpose of increase of their availability and efficiency were corrected; on the basis of continuous monitoring of the developing influence of the educational environment of higher education institution on students action of various factors at different stages of professional socialization of the specialist is corrected; the conclusions received at the previous investigation phase are corrected.

During a productive and estimated stage of experiment according to efficiency of educational environment profiling it was noted that initial (at the time of stating experiment stage) conditions of experimental and control groups in general coincide, and final (after the termination of the forming experiment stage) – differ. It allows to draw a conclusion that the effect of changes is caused by implementation of the Concept of education profiling.

The conducted research on system theoretical and practical justification of educational environment profilisation, detection of the main intrinsic characteristics and tendencies of this process in modern sociocultural and social and economic conditions on the basis of the complete conceptual analysis of its formation and development showed that the problem of research is solved within, determined by its subject, the purpose and tasks.

References

- [1] UNESCO, & ILO, Technical and vocational education for the twenty – first century: ILO and UNESCO recommendations, Paris: UNESCO and Geneva: ILO, 2002.
- [2] M. Pavlova, Technology and vocational education for sustainable development, UNESCO-UNEVOC Book, Series: Technical and Vocational Education and Training: Issues, Concerns and Prospects, Griffith University, QLD, Australia, Springer Science+Business Media B.V., 2009.
- [3] E.M Kargina, Theoretical and methodological bases of pedagogical process profiling in technical higher education institutions, the monograph, Moscow, 2007.
- [4] E.M. Kargina, Qualitative characteristics of productivity of the regional educational environment profilisation, European social science journal, **10-2** (2012), 43-52.
- [5] R.L. Plackett, Karl Pearson and the Chi-Squared Test, International Statistical Review (International Statistical Institute), 1983, 59–72.
<http://dx.doi.org/10.2307/1402731>

Received: January 11, 2015; Published: January 26, 2015