

average and higher education; Bologna process; national particularities; competencies; mobility; doctor degree; post-university education

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**SYSTEM OF PREPARING THE PERSONNEL FOR RAILWAY OF  
UZBEKISTAN**

**Summary.** The paper, by the example of training for the railway industry in Uzbekistan, focuses on the experiences and characteristics of Uzbekistan's integration into the international system of education, a framework of qualifications of the European Commission. Tashkent Institute of Railway Engineering has: rated the students' knowledge of the possibility of mutual recognition and accreditation based on the comparability of disciplines and curricula; included in its institutional strategy doctoral program, which has national features aimed at providing career opportunities for young researchers and university teachers based on the fundamental nature and the humanization of education, providing the preparation of the highly qualified specialists, ensures the interconnection and interdependence at all levels of technical education: secondary, undergraduate, graduate, doctoral and post-graduate training and re-training to maintain the knowledge and skills of teachers at the level of requests engineering and production of the XXI century.

**СИСТЕМА ПОДГОТОВКИ КАДРОВ ДЛЯ ЖЕЛЕЗНЫХ ДОРОГ  
УЗБЕКИСТАНА**

**Аннотация.** Статья, на примере подготовки кадров для железнодорожной отрасли в Узбекистане, посвящена опыту и характеристикам интеграции Узбекистана в международную систему образования, в структуру квалификаций Европейской комиссии. Ташкентский институт инженеров железнодорожного транспорта проводит: оценку знаний студентов для возможности взаимного признания и аккредитации на основе сопоставимости дисциплин и учебных программ; в его институциональную стратегию включена докторская программа, которая имеет национальные особенности, направленные на обеспечение возможности карьерного роста для молодых исследователей и преподавателей ВУЗов на основе фундаментального характера и гуманизации образования, обеспечивающая подготовку высококвалифицированных специалистов, обеспечивающая взаимосвязь и взаимозависимость всех уровней технического образования: среднего, студентов, аспирантов, докторантов и слушателей курсов подготовки и переподготовки подготовки для поддержания знаний и навыков преподавателей на уровне запросов проектирования и производства XXI века.

The integration processes penetrate all spheres of human activity both in social-economic and cultural sphere. The education as a phenomenon of the culture and simultaneously its moving power also has a typical feature, concluded in its integration processes [1].

In modern European cultural-educational space the integration is considered as process and result of intercultural interactions specialist, which promotes the development of new quality of education, becomes actual as for the other continents and folks. Integration process on creation of European space of the higher education (ESHE) named Bologna is founded on two-level system of secondary special professional and high technical education, which is an efficient base for research and economic achievements of many countries [2].

The central element of the development of European space of higher education (ESHE) and important mechanism of the achievement of comparability and transparencies are qualification frames. They help to high school in development of the modules and programs of the education, assist the confession of qualification and all forms of previously obtained education. The comparability of the proposal by European Commission the frame qualification for continuous education with national qualification frames certified relatively to the ESHE general structure, for present-day to day is an actual task and determined efforts of all participant of integration process are necessary for its realization.

Deep social-economic reforms, occurring in Uzbekistan, connected with transition to market mechanism of management, as well as ideological changes directed to development of open society, objectively lead to interaction with countries and folks, to development of the interaction in professional sphere. As a participant integration process Uzbekistan reformed its educational system. On its structure it is similar to the systems of European countries and countries of South-East Asia, the high educational institutions of Great Britain, Russia, Germany, Malaysia, Singapore, Italy participate in educational process confirming one of the fundamental element of international cooperation in respect of mutual confession and accreditations. Nowadays the acting system of rating system for estimation of the student knowledge allowing clearly and uniquely match the program of discipline and learning plans has a great importance.

Other important element in the international integration of the education is inclusion of postdoc programs in their own institutional strategies and concentration efforts on granting the possibilities and development of career of beginning researchers and teachers.

At the same time the system has national features:

- obligatory free general secondary education for 9 years;
- full free specialized secondary education on the student's selection for 3 years;
- bachelors education not less than 4 years;
- magistracy on the base of bachelor degree not less than 2 years;
- education after higher education in two directions: preparation of scientifically-pedagogical personnel (PhD); the retraining and increasing qualification. The characteristic feature of the preparation of scientifically-pedagogical personnel is concluded in acceptance for 3 years education senior scientific employee-researchers position. The Bachelors are accepted after career pattern not less than 5 years, but masters - after 2 years of the practical work. Also preparation of doctor is provided without absence from own work. For this the interested person must enter as a candidate.

Occurring in Uzbekistan changes in the educational system are connected to the State as the main reformer switching to market relations and regulate by Law of the Republic Uzbekistan "On education" and "National program on preparing the personnel", enforced in 1997. In accordance with this law the State Educational Standards (SES) were designed and approved, the following united requirements are the base of them:

- fundamentalization and humanization of high technical education;
- succession and continuity of the technical education;
- advanced preparing of the technical personnel;
- development of skill self development critical thinking and creative activity;
- mobility of the educational programs;
- academic mobility of the students;

- extension of the possibilities of education continuation;
- multilevel checking of education quality.

According to acting position, 30% of bachelor and master student on results of the total tests are trained on state grants, 70% - on pay base. In payment for on a contract the social protection trained is included, i.e. from 38% to 75.7% of education payment returns to the student as scholarships. Students trained instate account also get the scholarship. The senior scientific employees-researchers get a salary. Preparation of doctoral thesis for resident is free, and in protection of the thesis for 6 months before the marked period encouragement in minimum amount of 20% of the payment of the labor (MPL) is provided.

In Uzbekistan the secondary special professional and higher education are financed from budget of the Republic through the Ministry of high and secondary special education (MHSSE) or from benefits of the branches of economy. For instance, Tashkent Institute of Railway Engineers (TIRE, old TashIIT) is financed by the State share railway company (SSRC) "Uzbekiston Temir Yullari" ("UTY"). In spite of the attribution of the educational institution the education in them are organized according to the united qualification requirements. Besides, the most important source of the financing is the off-budget facilities on contracts for pay education.

Organizing structure of SSRC "Uzbekiston Temir Yullari" includes the TIRE with academic secondary educational school and Road centre for higher qualifications, preparation and refresher courses of the personnel; the professional colleges of railway located in Tashkent, Samarkand, Kokand. They realize preparing the personnel on the main trends of enterprises and institutions of companies and other branches of the national economy of Uzbekistan.

The measures of social protection spread on railway education - *free medical service; the guaranteed job; the payment of scholarships to the railway college students.*

In TIRE on four faculties 5 thousand student are trained, training on 18 directions of bachelor and 11 masters specialty is realized, increasing to qualifications of leaders, specialist (engineering-technical workers), as well as retraining and increasing the qualification of the personnel of mass professions (the workers). Increasing to qualifications and retraining is realized in Road centre (CKP TIRE) on proposals of the subdivisions on the base of the contract signed with SSRC "Uzbekiston Temir Yullari". The learning plans and programs are developed together with teacher of the specific chairs of the institute and specialist of control and centers of companies.

Table 1

Schedule of the time history of the number of trained,  
bachelor and masters specialties directions

No	School year	Direction of education <sup>1</sup>	Number of students	Including	
				Bachelors	Masters
1	2009-2010	16/18	3640	3442	198
2	2010-2011	18/17	3903	3716	187
3	2011-2012	18/17	4073	3887	186
4	2012-2013	16/11	4093	3873	220

In professional colleges of the railway company is realized the preparation on professions and specialties of the railway traffic, corresponding bachelors directions. 85% of graduate of the professional colleges got diploma of the younger specialist, the company provides a job. The other graduates enter in high educational institutions, serves in rows of army, work in the other branches.

It is considered that in order to become a competent specialist it is necessary to possess its key, base and special competency. The key competencies are the total competencies of the person required for social-productive activity of any modern specialist; base - in determined professional area; special - for performing the concrete action, decisions of the concrete problem or professional task.

<sup>1</sup>Bachelors/Masters

The accustomed determinations and competency as a total of the knowledge and skills from the past. Not realized competency, remaining as a potential, is not a competency, but, at most, is a hidden possibility.

The base of the correspondence of the prepared specialist to "call of the time" is the multicomponent process of technical education. Its correspondence to the requirements is inspected by multilevel monitoring of the quality technical formation. Monitoring realize on state level by Test centre under the Cabinet of Ministers of the Republics of Uzbekistan (CM RUZ); departmental (MHSSE RUZ), high educational institution (systematic current, intermediate and total rating-supervision; output supervision on completion of the education by the State Academic Commissions on the base disciplines and exhaust qualification work of a student, as well as high school (the systematic self-estimation of its activity; the customer (the user) of the educational services. Monitoring is allowed in good time respond to system malfunction.

The important instrument of self-estimation of high educational institution is a sociological studies (questioning) of educational process participant and customer of the personnel [3]. The estimation of the activity of administrations, teaching personnel and student is a base for improvement of the educational process. Self-estimation must be conducted regularly and objective. Then its results will become as a good base to scheduling the plan of the improvement of education quality. Self-estimation is directed on provision of competitive quality. Its essence is concluded in answer to three main questions: *How do we work? What are criteria of self-estimation? What we have to do?*

On the state level TIRE successfully passed through the checking the state and adductions of the main parameters of the scholastic process installed by requirements to professorial-teaching staff, training (the remaining knowledge), scholastic-auxiliary personnel, administrative workers; pedagogical, training, information, management, checking technology; material and technical; normative-legislative and scholastic-methodical provision. At present the Institute prepares to state monitoring on revealing the rating of high schools of the Republics.

One of the key factors providing interpenetration of pedagogical cultures, the basis of the shaping the complex competency is mobility and preparation of scientifically-pedagogical personnel on doctoral program. In decision of these tasks TIRE under the active financial aid of SSRC "Uzbekiston Temir Yullari" has gained the perennial experience.

Two students graduated the MIIT in 2012 are directed on working in TIRE and control department of SSRC "Uzbekiston Temir Yullari".

At present the following students continue their education:

- in Petersburg State Transport University (PSTU): 8 on engineering program; 8 in magistracy; 7 in graduate school;
- in National University of Science and Technology (MISIS): 4 on engineering program; 18 in bachelor; 7 in magistracy;
- in Moscow State University of Railway Engineering (MIIT): 1 in graduate school.

The preparing of the personnel in leading Russian universities for scientifically-pedagogical activity is actively conducted. So, from 2007 to 2012 in PSTU, MISIS and MIIT 121 specialists for TIRE and enterprise SSRC "Uzbekiston Temir Yullari" is prepared.

The given circumstance is explained by longing of high school to prepare specialist capable in a very short period be adapted to quickly changing terms of professional activity, new information technologies and communication systems, development of the most important personal functions: inventiveness (the ability of the person's choice); reflexive ability (the ability to value their own actions); existence ability (searching for the sense to life and creative activity); liability (in accordance with wording "I am responsible for all"); the autonomies of personality. Then, the task of the teacher will be concluded not only in need of the formation of the student's knowledge and teachings, but also ensuring the possibilities for formation and developments the aforementioned function of personalities, learning process gains the sense different from traditionally understood. In this context the attendance gain the importance for contact between teacher and student not reducing the importance of the independent work. The key condition of the specialist formation is non-audience component – "re-work" as important component of pedagogical technology.

The strategy taking on Lisbon summit of EU in June 2000, named Lisbon strategy, considers universities as an important partner, acknowledging value of their scientific activity, leading experience in study and innovations, presence of resource and competitiveness.

The component elements of the educational system define the set of dominant factors, greatly influencing on quality of the education and training of the personnel - fundamentalization and humanitarization of education.

*Fundamentalization* of high technical education as a new paradigm of the technical education provides preparation not only high professionals, but also wide educated creative personalities, that is impossible without essential reinforcement of fundamentalization of scholastic process. First, in engineering and production the fundamental sciences of the last years changed to constantly acting and the most efficient power; secondly, fundamentalization of technical education is effectively promotes the formation of the critical thinking and creative activity; thirdly, fundamental sciences provide the efficient integration of natural science, professional and humanitarian knowledge.

Table 2

Results of the distribution of graduate students of PSTU  
on enterprise SSRC "Uzbekiston Temir Yullari"

No	Year of finishing the education	Number of graduate students	including								
			TIRE	Tashkent railway college	Management department of SSRC "UTY"	Regional railway nodes	UE "Uzjeldor remmash"	JSE "Tashjeldor remvagon"	Foundry mechanical plant	JSE "Uzjeldorconter"	Post-graduate
<b>Engineers</b>											
1	2007	6	1				2	1		1	1
2	2008	12			1	1	2	1			7
3	2009	14	2			4	1				7
4	2010	24	7		7	9	1				
5	2011	24	2	4	2	11	3		1	1	
6	2012	12	10		2						
Total		92	22	4	12	25	9	2	1	2	15
<b>PhD students</b>											
1	2010	1	1								
2	2011	16	14			2					
3	2012	10	9		1						
Total		27	24		1	2					
Summary		119	46	4	13	27	9	2	1	2	15

Table 3

Results of the distribution of graduate students of MISIS  
on enterprise SSRC "Uzbekiston Temir Yullari"

No.	Year of finishing the education	Number of graduate students	MD "Uzjeldorremmash"	Foundry mechanical plant	Andijan plant	Post-graduate
<b>Bachelors</b>						
1	2011	10	1	5		4
2	2012	6		2	1	3
Total		16	1	7	1	7

In selecting the teachers and balancing their status the fundamentalization of the education pursues the achievement of the principle of unity of teaching and research activity, for realization scientific methods of the cognition and system approach. Serious fundamental preparation is necessary to the specialist for development also, mastering and efficient usage of scientifically based and information technologies, technology on microlevel (nanotechnologies, optotechnologies, microtechnologies etc.), new material (including on composite base) with given feature and characteristic, robotics and robotechnical systems.

Gumanitarization of technical education should be directed on approving the person as the top of social value, opening of its abilities and satisfaction of varied educational need, provision to priority of general mankind valuables, harmonies in relations of the person and surrounding ambiances, formation the holistic picture of the world, high intellectual wealth, cultures and planetary thinking. Modern specialist must possess with the broad humanitarian knowledge, defining his high intellectual wealth and culture, will conclude in saturation of his with the components of ethical (moral), aesthetic, ergonomical, ecological, economic and legal education.

Table 4

Correlation between block of discipline of the learning process

Block No.	Elemental groups of discipline	Correlation in %	
		Bachelors	Masters
1	Humanitarian and social-economic	25	
2	Mathematical and natural science/general methodological	23	30-45
3	Common engineering	36	
4	Special disciplines and selection	10	55-70
5	Additional	6	

Understanding needs in increasing the quality of preparing the personnel with higher educations of the deep modernization of the material and technical basis and impossibility of the similar functioning in the shortest period The Board of the institute has directed activity of the chairs to broad usage for practical person of the teaching in virtual laboratories, on creation of 30 specialized multimedia auditorium with 7 interactive electronic boards, corporative network uniting 1010 (1 computer on 4 students) computers in 70 local information networks, equipping information resource centre with 57 computers, copying and multiplying equipment for ensuring the access to electronic source of the knowledges.

One of the most important tasks of modernizations of the high technical education is forming professorial-teaching staff capable to create on students deep firm foundation from natural scientific and general professional disciplines, teach their self education and graft the skills of the research work.

In the Worldwide declaration on high for the XXIst century (Paris, UNESCO, 1998) is noted: "It is important to teach the students to know how to design and create new. But for their self-development is more important to teach creative design its own activity. Necessary for educational institution to graft the taste to education, teach to get the pleasure from training, create the possibility to learn, develop the curiosity".

The model of the development of education in the XXIst century is connected to change the educational paradigms, providing transition from traditional to self-educational activity [4].

For development the skill of the self-education it is necessary to develop the cognitive activity of students; skills of the independent functioning; the skills to creative activity - a skill by itself to gain the knowledge. So in scholastic program of discipline of the higher education time is provided for independent functioning of the student to approximately equal lecture load.

Receivership of the technical education is a base to its continuity in organizing and function point of view. The staff of the institute works on intercoupling and interdependence provision of all steps of the system of the technical formation - a relationship secondary education, bachelors, magistracies,

doctors, and in postdoc education - increasing to qualifications and retraining of the personnel, providing and supporting of professional knowledge, skills of the teachers at a rate of engineering and manufacture of the XXIst century's request.

SSRC "Uzbekiston Temir Yullari" realizes the preparing of the personnel on really deficit profession in educational institutions of the Russian Federation - Petersburg and Moscow state university of the ways of connection and in National research technological university "Moscow institute of steels and alloy" (MISIA).

Thereby, institute at support of SSRC "Uzbekiston Temir Yullari" endeavours for broad international cooperation and integrations of the education in system of the high technical education that is a priority direction in preparing of the competitive railway personnel.

## CONCLUSION

Thus, Tashkent Institute of Railway Engineers (TIRE) implementing training for the railway industry in Uzbekistan disposes experience of integration into the international system of education, a framework of qualifications of the European Commission. This experience has features that are enclosed in:

- a) the rating assessment of students' knowledge of the possibility of mutual recognition and accreditation based on the comparability of disciplines and curricula;
- b) doctoral programs aimed at providing career opportunities for young researchers and university teachers, backed by many years of creative communication with the universities of Moscow and St. Petersburg;
- c) fundamentalization and humanization of education, providing training for the highly qualified specialists;
- d) ensuring the interconnection and interdependence of all levels of technical education: secondary, undergraduate, graduate, doctoral and post-graduate training and re-training to maintain the knowledge and skills of teachers at the request of engineering and production of the XXIst century.

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