The Bologna Process: Exacerbation of Social Competences among Civil Engineering Students

Evgeny Shnyrenkov*, Igor Pryadko

Moscow State University of Civil Engineering, 26 Yaroslavskoye shosse, 129337, Moscow, Russia

Abstract

The Russian education reform follows the Bologna process pattern and seeks to get construction engineering students develop social and professional competencies. The co-authors of the paper believe that the social competencies of the students of the civil engineering university must be focused on their future professional activities. The social competencies, developed by the students in the course of their studies, must help them to solve the most relevant problems of the urban environment and its development.

Keywords: Russia’s education reform, the Bologna process, training of construction engineering specialists, urban environment, housing quality, cultural competencies, professional competencies

1. Introduction

Recent reforms in the higher education, particularly, in the civil engineering education, enjoy extensive coverage in mass media, including printed media and Internet forums. However the most valuable conclusions, derived as a result of numerous discussions, are those made by the top executives of construction companies, who have a clear vision of their subordinates’ personal and professional strengths and weaknesses. The most illustrative examples were analyzed by the participants of the round-table discussion, entitled Innovations in the Construction Industry [1]; its excerpts were published by the Expert magazine and entitled The Enemies of Construction Innovations [2].

* Corresponding author. Tel.: +7-903-710-25-52; fax: +7 (499) 183-44-38
E-mail address: easch@yandex.ru
and in the collection of recommendations compiled as the proceedings of the round-table discussion of advanced construction technologies and construction project scheduling. Although the objectives of the Russian higher school reform are not analyzed in the recommendations, each suggestion, made by the construction practitioners, must be implemented to solve the problems of the Russian higher education [3].

2. The Principles for the Improvement of Social Competencies of Civil Engineering Students

According to the basic provisions of the Bologna process documents, the educational reform pursues the following goals and objectives:
- The implementation of a system essentially based on the two main cycles, undergraduate and graduate; access to the second cycle shall require successful completion of the first cycle studies, lasting a minimum of three years. The second cycle should lead to the master and/or doctorate degree as in many European countries;
- The implementation of a system of easily readable and comparable degrees, also through the implementation of the Diploma Supplement, in order to promote European citizens employability and the international competitiveness of the European higher education system;
- The establishment of a system of credits as a proper means of promoting the most wide-spread student mobility;
- The Promotion of mobility by overcoming obstacles to the effective exercise of free movement of students in respect of their access to study and training opportunities and to related services, and free movement of teachers, researchers and administrative staff in respect of recognition and valorisation of periods spent in a European context researching, teaching and training, without prejudicing their statutory rights;
- The promotion of European co-operation in quality assurance with a view to the development of comparable criteria and methodologies;
- The introduction of the right to study the choice-based disciplines along with the obligatory ones to assure the required number of the accumulated credits;
- The promotion of the lifelong learning concept;
- Other supplementary means aimed at the compilation of the curricula motivating students to develop academic research projects [4-7].

Development of cultural and professional competencies by bachelor and master students is an essential innovation of the higher education. Cultural competencies help the future specialists to understand the social significance of their profession both within the framework of a professional organization, and in the course of their interaction with the society [8-10]. It is noteworthy that, in the market environment, any work is performed by a highly skilled specialist for the benefit of his/her employer. The market share of the employer’s products or services is the corporate success criterion [11].

Any economic activity makes sense if it serves the needs of individual persons and the society as a whole. No electric energy is generated for its own benefit; no machines are designed and produced for their own benefit, and no buildings are built for their own benefit. Whenever specific industries and the national economy forget about the mission of their operation, that is, the satisfaction of versatile human needs, they lose their development benchmarks. The development pattern of the Russian national economy has proven the competitive strength of the industries and enterprises that are focused on the most profound satisfaction of professional and personal human needs. A set of social competencies to be developed by students of engineering universities can be compiled with account for the understanding of the role of human needs in the present-day economy, as a whole, and in its specific industries, in particular [12, 13].

Whenever we try to answer the question what factors influence the development of social competencies by students of a civil engineering university, we need to realize that the present-day Russian society is in the process of radical transformations driven by the global development trends, on the one hand, and by the logic of the transition from the industrial to the post-industrial society, on the other hand. Any changes in the Russian political system, coupled with the transformations of its economy and industrial production, have changed the social structure of the Russian society. Market relations, followed by the emergence of the new types of corporate activities and new social groups, have produced a substantial impact on the urban space. Market laws shape up Russian cities and towns, their housing construction policies and economic activities. Today the structure of built up urban areas serves as a sensitive indicator of socioeconomic changes. Industrial enterprises lose in the competitive struggle, move outside of
cities or even cease to exist; office buildings and major malls take their place. These events are the consequences of the market relations that govern the urban economy and the housing construction policy. Urban planning principles are driven by the cost of the urban land determined by the market. Market relations facilitated the transfer from modernism to post-modernism in the urban planning [14]. This transfer manifested itself in the abandonment of the urban planning policy based on the principles that read as “it’s a must” and “the city must develop to the plan” to the urban planning style that rested on the principles that read as “it may be like that” and “natural urban development processes as a guidance.” The sole perception of the urban space as the super-profitable capital investment instrument increased the number of infill development sites. They aroused conflicts between the interests of investors, who contributed substantial amounts into construction and development projects, and the residents of those urban districts whose living environment deteriorated because of the construction of new buildings in the close proximity to their homes [15 – 17].

Not only does the housing market, driven by the emerging social groups and classes, determine the typology and the quality of new buildings, but it also pinpoints their location. As a rule, expensive elite housing is built closer to the historic city centre or in the areas of “good addresses” to develop an affluent social environment. Despite the willingness of residents of expensive houses to maintain the “secluded” lifestyle, the social structure of cities remains homogeneous, or even chaotic, looking like a food product made of thoroughly mixed ingredients. The traditional social structure and long-standing principles underlying the structure of the built up urban areas prevent the development of residential areas according to the pattern of the social and economic segregation. Strange as it may seem, the infill development style and the high costs of standard residential houses prevent the urban segregation of residents; therefore, residents living in the same community may belong to different social classes. As for Moscow, the city has three large communes that demonstrate strong economic and political backgrounds. They are the Rublev highway and the Gold Mile that stretches along the Ostozhenka Street. The third one occupies Khodynka field, where elite housing has been built lately.

Economic trends, social demands, and historic traditions shape up the urban design. The day-to-day life of urban residents is dependent on such core elements, as schools, libraries, kindergartens, hospitals, social housing, sports facilities, and convenience stores. However the city is not a collection of buildings that differ in appearance and function. The city has a complex infrastructure that includes the transport accessibility of its facilities and sophisticated utility networks (heating, gas, water, electric energy, sewage) that are necessary to have the appropriate urban living conditions in place.

The city, being the collective result of the years-long and even centuries-long human activities, develops humans, builds their behavioral patterns, and promotes the development of the urban culture as a set of numerous urban subcultures. Unlike the traditional culture that developed in the agricultural environment and under the influence of the natural climatic turmoil, when life itself meant a permanent risk and an ongoing struggle for survival, the present-day urban life is independent from natural conditions; it is more comfortable and safer. The absence of any immediate link between the activities of an urban resident and the process of food procurement and the absence of the need to take pains to provide for the appropriate living conditions (heating, water supply, etc.) in the day-to-day life help urban residents to safeguard themselves against any anthropogenic risks that are in abundance in the city. These risks involve the regular use of various machines, including cars, and the advantages, that they offer, exceed the risk of their use multifold. This state of affairs boosts the urban culture that considers the risk as the main goal. Young people practice life-threatening ways of spending their free time, in particular, street racing and jumping. Street racing is practiced by affluent young people; the availability of expensive and high-powered cars is a binding condition of participation in street races. Jumping is widely spread among middle class young people or among those young people who belong to the lower class. Street racing and jumping may be immediately dangerous to life and health, and, at the same time, they are a means of self-fulfillment in the social environment and a method of the urban space exploration.

The present-day city is a mix of market relations, social planning, and technological/environmental problems. This idea must serve as the basis of the competency building approach [18, 19].

How should the city develop? What do executives of construction companies expect from the system of civil engineering education? According to L.V. Vlasenko and I.P. Pryadko, the co-authors of an article on the problems of higher education in civil engineering, “top executives of construction companies believe that the competence of
their employees means flexible thinking and the ability to switch to other fields of work. Profound knowledge shall not generate any narrow opinions or inflexible thinking. We live in the age of the unbelievable acceleration of the technological progress, and the latter produces impact on the construction industry” [20].

Given the processes that are specified above and that are typical for the present-day urban areas, we believe it expedient to develop or select several research ideas that would comply with the principles of the competency building approach and update the methodology of teaching humanities at the civil engineering university [21].

Can we identify the reference point in the present-day system of methodological coordinates that would make it possible for us to develop the optimal solution for the dual problem of teaching humanities at the university of civil engineering? This reference point exists; moreover, its location is identified quite accurately. It is identified by the present-day society, or by the goal that is pursued by the individuals that comprise the society in question. A graduate of a civil engineering university is, in the end, a specialist who is engaged in the construction of housing which is a very popular market product.

Despite the fact that housing is a liquid market commodity that enjoys persistent demand, its quality and comfort cannot be limited to the floor area and the availability of basic amenities. Presently, residents never assess the place where they live irrespective of its location; location determines the quality and profile.

The production of this popular product by the construction industry is the final goal, and its attainment in the process of training construction engineers must involve the “…employment of any effective resources and the expertise accumulated worldwide… Currently, the international construction practice maintains a systemic approach to effective business management. This systemic approach consolidates the management systems employed by the construction industry” [1].

The co-authors of this article believe that the notions of the housing quality and the urban structure that represent a combination of technological, economic, social, and psychological properties, may serve as the points of reference for the competence building approach as a principle underlying the reformation of the Russian education system, given the application by the graduates of their knowledge and skills to design and build advanced housing facilities and develop a comfortable living environment [22-25].

Another factor, boosting the development of social and professional competencies, is the social urban environment, the environment that is immediately related to the urban structure, the environment that designs the urban structure and that is designed by the urban structure. The extent of their mutual influence, the identification of the primary source of the urban structure among the demands of the urban environment, the willpower of the urban executives, the market laws, or the urban planning; the historic conditions of the urban infrastructure, the economic potential of different social groups and layers, - each of the above issues contemplates the dialectic unity of the urban structure and the social environment.

The factors, analyzed in this article, may serve as the foundation for the competency building approach, so that students could develop the idea of their future professional activities and their ultimate result – a comfortable living environment that the resident would be proud of. Students need to develop an idea of their future professional activities, and this objective may be attained by the disciplines taught with the help of dynamic and interactive technologies [26-29].

Moscow State University of Civil Engineering (MGSU) has incorporated the course units, developed by the lecturers of Department of Social and Political Sciences (Table 1), into the master and bachelor level curricula with a view to the development of social competences and the implementation of the principles of the Bologna process at the university. The structure of the course units and the content of its sections reproduce the social peculiarities of the construction industry, the problems of the social interaction between construction companies and the local community, and the problems that accompany the development and formation of the urban environment in recent times.

Table 1. Sociology-related Course Units Designated for the Principal Majors Offered at MGSU.

| Major                | Graduate Qualification Level | Course Unit                                      |
|----------------------|-----------------------------|--------------------------------------------------|
| Civil Engineering    | Bachelor                    | Sociology in the Construction Industry          |
| Civil Engineering    | Bachelor                    | Urban Sociology                                 |
| Civil Engineering    | Master                      | Social Aspects of the Urban Development Activity |
The course units, enlisted in Table 1, strive to develop the following competences:

- the understanding of the social value of the students’ future profession;
- the understanding of the social problems experienced by the construction industry;
- the ability to analyze the problems and processes of social significance;
- the ability to work in a team;
- the willingness to perform the social interaction;
- the ability to assume the responsibility for any decisions made;
- the employment of the basic provisions of social sciences when solving social and professional problems.

3. Conclusions

If we take a closer look at the attitude of the Moscow (and Russian) universities towards ecology, ergonomics, environmental initiatives, and violations of the environmental and ergonomic legislation, we realize that their attitude contemplates a paradox, because the violations, committed by the universities, and the initiatives, that they take, apply to the same notions and items! For example, according to the reports issued by the Moscow Office of the Federal Service for the Control over the Protection of Consumers’ Rights and Human Welfare, several Moscow universities store their waste in the inadmissible way. The same universities have launched separate waste collection programmes and recycling initiatives. Thus, their waste collection pattern is paradoxical, as it comprises both a noble initiative and a violation of the law. Isn’t it the outcome of poor in-house communications?

Any ecological initiatives, originating from Russia, may be taken and advanced by several institutions, including competent government authorities, independent international and Russian environmental organizations, and the universities that partner with the Federal public programme entitled Green Institutions of Higher Education in Russia.

It is important to note that the WWF’s choice of developers of environmental projects is perfectly correct: the WWF implements its environmental initiatives at the universities, the places full of intelligent young people. Young people are forward-minded; they are ready to develop ecological projects in the course of several years to come. However, many Russian students need to get ready to change their personal lifestyles, if they want to be able to accomplish environmental goals and objectives. According to S.N. Bobylev, Professor, Moscow State University, any green university must exercise its educational function in the field of environmental protection. [35] It’s important to understand that it makes no sense to make students and lecturers separate their waste. This initiative must be driven by the personal philosophy that everyone shares.

References

[1] Volovik, M.V., Ershov, M.N., Ishin, A.V. Innovatsii v tehnologii i organizatsii stroitel'stva [Innovations in Construction Technologies and Processes] (2013) Technology and Organization of Construction Operations, 4(5), pp. 8 - 16. (rus)
[2] Stupin, I. Vragi stroitel'nykh innovatsiy [Enemies of Construction Innovations] (2007) Expert, 7(568), pp. 44 - 46. (rus)
[3] Romanova, E.V. Vysshie stroitel'noe obrazovanie: problemy i perspektivy [Higher Education in Construction: Problems and Prospects] (2006) Collection of reports of the Science and Practical Conference “Scientific and Technological Creativity of Youth”, Moscow, pp. 48-52. (rus)
[4] Ivanova, M.A. Reforma vysshee shkoly: vzglyad iz stroitel'nogo vuza [Higher Education Re-form: a Glance from the Institution of Higher Civil Engineering Education] (2014) Proceedings of the 17th International Science and Practice Conference of Students, Master Students, Postgraduates and Young Researchers on Fundamental Research in Civil Engineering Education. Moscow, MGSU Publ., pp. 711 - 714. (rus)
[5] Miloradova, N.G. Gumanitarnoe obrazovanie v tehnikhnom vuze pri kompetentnostnom podkhode. Teoriya i praktika realizatsii kompetentnostnogo podkhoda v stroitel'nom obrazovanii [Teaching Liberal Arts at the University of Technology in Furtherance of the Competency Building Approach. Theoretical and Practical Implementation of the Competency Building Approach in Civil Engineering Education] (2009), Moscow, Arkhitektura-S Publ., pp. 18 - 24. (rus)
[6] The Bologna Declaration. URL: http://www.enqa.eu/wp-content/uploads/2013/03/bologna_declaration.pdf Accessed: January 21, 2015.
[7] Communiqué of the meeting of European Ministers in charge of Higher Education in Prague on May 19th 2001. URL: http://www.enqa.eu/wp-content/uploads/2013/03/010519PRAGUE_COMMUNIQUE.pdf Accessed: January 21, 2015.
[8] Romanova, E.V. Puti povysheniya sostav'noy kompetentnosti studentov v usloviyakh vuza. [Methods for Improvement of Social and Professional Competencies of Students within the University Environment] (2013) Proceedings of the 2nd International Science and Practical Conferene on Present-day Humanitarian Problems. Moscow, MGSU Publ., pp. 156 - 176. (rus)
[9] Belyaeva, T.B. Mestnost's sostav'noy kompetentnosti [The Model of Social Competence] (2005) Vestnik of Yaroslavl the Wise Novgorod State University, (31), pp. 8 - 12. (rus)
[10] Gamayunova, O., Vatin, N. Results of the Admission Campaign: Which is the Future Specialist in the Field of Civil Engineering? (2015) Applied Mechanics and Materials, 725-726, pp. 1640-1645.
[11] Kaklausky, A., Daniunas, A., Amaratunga, D., Urbonas, V., Lill, I., Gudauskas, R., D'amato, M., Trinkunas, V., Jackute, I. Life cycle process model of a market-oriented and student centered higher education (2012) International Journal of Strategic Property Management, 16 (4), pp. 414-430.
[12] Ivanova, Z.I., Yudenkova, O.V. Human Capital of Russia’s Construction Industry (2013) Mid-dle-East Journal of Scientific Research, 16(8), p. 1086.
[13] Trubina, E.G. Gorod v teorii. Opyt osmysleniya prostranstva. [Urban Theory. Practical Appre-hension of Space.] (2013) Moscow, NLO Publ., 520 p. (rus)
[14] Shnyrenkov, E.A. Vliyanie modernizma i postmodernizma na formirovanie gorodskoy zastroyki [The Influence of Modernism and Post-modernism on Built-up Urban Areas] (2010) Vestnik MGSU, 4-5, pp. 163 - 168. (rus)
[15] Shnyrenkov, E.A. Gorodskaya politika i formirovanie gorodskogo prostranstva [Urban Policy and Urban Space Development] (2011) Proceedings of the 10th All-Russian and 8th International Science and Practical Conference “Social and Economic Problems of Urban Development”, pp. 242-245. (rus)
[16] Boltaiiskiy, A.A., Pryadko, I.P. «Obuzdat’ stikhiyu»: prob lemy sovremennogo gradou-stroystva [Riding the Whirlwind: Contemporary Urban Planning Problems] (2014), Urban Studies, (2), pp. 14 - 24. (rus)
[17] Boltaiiskiy, A.A., Pryadko, I.P. U goroda v plenu: protivorechiya v razvitii urbanisticheskoy kul'utry [Imprisoned by the City: Contradictory Development of the Urban Culture] (2014), Bio-sphere Compatibility: Man, Region, Technologies, 1(5), pp. 65 - 74. (rus)
[18] Glazychev, V.L. Urbanistika [Urban Studies] (2008), Evropa Publ., 218 p. (rus)
[19] Glazychev, V.L. Gorod bez granit [A City without Borders] (2011) Moscow, Territoriya Bu-duشهego Publ., 2011, 398 p. (rus)
[20] Vlasenko, L.V., Pryadko, I.P. Professional'naya kompetentnost' v sotsial'no-professional'noy sfere v otziymatiy [Professional Competence of Construction Industry Specialists Assessed by Construction Executives (Based on the Sociological Surveys) (2012) Conference “Integration, Partnership and Innovations in the Con-struction Science and Education”, Moscow, MGSU Publ., 2012, pp. 656 - 660. (rus)
[21] Savina, E.A. Professional'naya napravlennost' lichnosti budushchego stroitelya i arkhitekta [Professional Orientation of the Personality of the Future Builder and Architect] (2010) Proceedings of the 7th International and 9th All-Russian Science and Practical Conference “Advanced Research into Humanitarian, Social, and Economic Problems of Construction and Architecture.” Moscow, pp. 367 - 370. (rus)
[22] Miloradova, N.G. Bolonskiy protsess: etap vnedreniya [The Bologna Process: Implementation Step] (2011) Vestnik MGSU, 6, pp. 551 - 555. (rus)
[23] Romanova, E.V. Preodolenie kompetentnostnogo nesootvetstviya pri podgotovke kadrov dlya investitsionno-stroitel'noy sfery [Overcoming Competence-related Inconsistencies in the Process of Training Construction Specialists] (2014) Proceedings of Volgograd State Teachers Training Uni-versity, 4(89), pp. 115 - 123. (rus)
[24] Usanova, K., Rechinsky, A., Vatin, N. Academy of construction for university applicants as a tool of university online marketing (2014) Applied Mechanics and Materials, 635-637, pp. 2090-2094.
[25] Vatin, N., Gamayunova, O., Petrosova, D. Relevance of education in construction safety area (2014) Applied Mechanics and Materials, 635-637, pp. 2085-2089.
[26] Savina, E.A. Usloviya realizatsii innovatsionnogo protsesa obucheniya spetsialista investitin-sfere-stroiteley sfery [Conditions for the Implementation of the Innovative Process of Teaching Construction Specialists] (2014) Proceedings of Volgograd State Teachers Training University, 4(86), pp. 31 - 38. (rus)
[27] Gamayunova, O., Vatin, N., Rechinsky, A., Razinkina, E. Distance Learning System Moodle for Training of Specialists in the Field of Civil Engineering (2015) Applied Mechanics and Materi-als, 725-726, pp. 1611-1616.
[28] Tuchkevich, E., Rechinsky, A., Vatin, N., Zolotova, J., Tuchkevich, V., The Benefits of Au-thorized Training Center Autodesk for Higher Education Institutions (2015) Applied Mechanics and Materials, 725-726, pp. 1626-1633.
[29] Zolotova, J., Vatin, N., Tuchkevich, E., Rechinsky, A., Autodesk Revit - Key to Successful Training of Highly Qualified Civil Engineers (2015) Applied Mechanics and Materials, 725-726, pp. 1617-1625.
[30] Ishkov, A.D., Miloradova, N.G. Formirovanie socialno-psihologicheskoj kompetentnosti v sist-eme podgotovki konkurentosposobnyh specialistov v stroitele'noy obrali [Formation of Socio-psychological Competence in the Training of Competitive Specialists in the Construction Industry] (2009) Moscow, Architecture-S Publ., 152 p.
[31] Florenskiy P.A. Prednapolyaznenoe gosudarstvennoe usiroystvo v budushchem [Presumable State Structure in the Future] (1991), Literary Studies, 5 - 6.