The REBUS project at Volga Tech: on the way towards student-centered learning

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Abstract

The paper analyses the impact of the REBUS project (REady for BUSiness) on development of student-centered learning (SCL) at Volga State University of Technology, one of the two Russian universities participating in the EU funded Erasmus+ endeavor to introduce entrepreneurial education for engineering students. Along with mobility, lifelong learning and employability, SCL composes philosophical grounds of a European Higher Education Area. Such tools as ECTS, Diploma Supplement and Qualification Frameworks are all aimed to help students to achieve certain learning outcomes, or statements that describe the knowledge

or skills students acquire by the end of a particular assignment, and help students understand why that knowledge and those skills will be useful to them. The authors perceive SCL as a complex phenomenon, representing both a mindset and culture of teaching and learning. In practice, it deploys innovative methods of teaching, and fostering transferable skills such as problem solving, critical thinking and reflecting thinking. The Russian government signed the Bologna declaration in 2003, thus giving path to series of reforms aimed at modernization of national university system, and increase of global competitiveness of Russian higher education institutions. Since that, Russia has taken extensive efforts to adjust its higher education system to the European standards. One of the most prominent steps was move towards Bachelor's - Master's – Postgraduate learning cycles in the vast majority of universities, along with introduction of mobility programmes, ECTS-like credit transfer system and Diploma Supplement. However, not too much has been changed at programme and classroom level to make learning process more student-centered. The authors argue that REBUS project with its intense use of blended learning, personalized tools for validation of competences and skills, and international mobility has created a new type of student-teacher relationship within one piloting programme, and can serve a good example of SCL in practice.

Key words: *higher education, student-centered learning, Bologna Process, international mobility*

Student-centered learning: a didactic concept or a political paradigm?

Student-centered learning (or SCL) is a complex phenomenon that is causing vigorous debates among academics in Europe and far beyond. In fact, the Bologna Process did not deal directly with SCL from the outset. Instead, the key principles of SCL are broken down into smaller action lines, and the concept itself was only substantially included in some official communique (e.g. the Leuven/Louvain-la-Neuve Bologna Process ministerial conference, 2009), and no official definition of SCL for the Bologna Process documents was put forward.

Eventually, however, the Bologna Process has come to include several elements which can help to establish a functioning SCL system. Many of these are tools which offer students increased flexibility and allow for better visibility of the qualifications that students gain, enabling increased comparability and compatibility across the European Higher Education Area. These tools also prove to be helpful in fostering SCL, since Bologna-inspired reforms also provide an opportunity for change, replacing some of the more traditionally rigid elements in higher education.

In fact, SCL composes philosophical grounds of a European Higher Education Area, as it is embedded into such areas as academic mobility, lifelong learning and employability. Such tools as European Credit Transfer System, mobility support programmes (of which the Erasmus+ is especially noteworthy), Diploma Supplement and Qualification Frameworks are all aimed to help students to achieve certain learning outcomes, or statements that describe the knowledge or skills students acquire by the end of a particular assignment, and help students understand why that knowledge and those skills will be useful to them.

Within the EU, the most serious efforts to rethink the meaning and the future of SCL included the EU-funded project entitled "*Time for a New Paradigm in Education: Student-Centred Learning*" (T4SCL, 2009-2010), jointly led by the European Students' Union (ESU) and Education International (EI). The T4SCL ideas were further developed in the project entitled PASCL *("Peer Assessment of Student Centred Learning in Higher Education Institutions in Europe"*). Both projects operated with the developed SCL Toolkit (ESU, & EI, 2010a), which is still the most comprehensive modern manual on basics of SCL and use of it in practice.

There is a general acceptance across Europe that SCL started to be researched and analysed long before the first Bologna Declaration of 19 June 1999 as one of the possible pedagogical approaches for higher education (ESU, & EI, 2010b, p.6). From philosophical point of view, SCL is broadly based on constructivism as a theory of learning, which is built on the idea that learners must construct and reconstruct knowledge in order to learn effectively, with learning being most effective when, as part of an activity, the learner experiences constructing a meaningful product. SCL is also akin to *transformative learning* which contemplates a process of qualitative change in the learner as an ongoing process of transformation which focuses on enhancing and empowering the learner, developing their critical ability (ESU, & EI, 2010a, p.2).

Paul Ashwin and Debbie McVitty (2012) in their approach towards SCL use the concept of student engagement, which can be realized in a variety of formats: in a wide range teaching and learning processes; in the scholarship of teaching and learning; in quality enhancement processes, in decision making processes; in learning communities (Ashwin, P. & McVitty, D., 2012, 344-345). Furthermore, conceptualizing the degree of student engagement, they highlight three broad degrees of engagement: *consultation* in which students engage with a fixed object that is not changed through their engagement; *partnership* in which students participate in the transformation of a pre-existing object of engagement; and *leadership* in which students create new objects of engagement (Ashwin, P. & McVitty, D., 2012, 346).

Nowadays the SCL Toolkit underlines a general acceptance across Europe that SCL is a learning approach, which focuses on the needs of the learner rather than

those of others involved in the educational process. It is also widely agreed that SCL ultimately has a far reaching impact on the design and flexibility of curricula, on course-content, on learning methods used and on consultation with students. It is also provides understandable and practically proven checklist to access compatibility of academic programmes with basic principles of SCL.

For the sake of brevity, this article operates definition of SCL given in the Toolkit: "Student-Centered Learning represents both a mindset and a culture within a given higher education institution and is a learning approach which is broadly related to, and supported by, constructivist theories of learning. It is characterized by innovative methods of teaching which aim to promote learning in communication with teachers and other learners and which take students seriously as active participants in their own learning, fostering transferable skills such as problem-solving, critical thinking and reflective thinking" (ESU, & EI, 2010a, p. 4-5; Geven and Attard, 2012, p. 155). Reviewing use of SCL principles in the wider national context (the Russian Federation), and on the local level (university and piloting academic programme) will allow us to reconsider the real meaning of one particular Erasmus+ project – REBUS, which, in fact, occurred to be much deeper in its philosophy than just get the students *Ready for BUSiness*.

Russia's higher education system in transition

As a participant of the Bologna process since 2003, the Russian Federation has taken extensive efforts to adjust its national higher education system to the standards and guidelines of the European Higher Education Area. In general, Russian higher education is characterized by a huge number of institutions (more than 700) and a relatively high extent of centralized regulation of the academic programmes' delivery, structure and learning outcomes.

The Federal Law 'On Education in the Russian Federation' (in power since 2013) introduced and set the current multilevel structure for training of specialists with higher education:

Bakalavr (Bachelor's level) — first cycle. Bachelor programmes have a standard duration of four years and are offered virtually in all fields of study with few exceptions (for example, medicine, which still keeps 'old-fashioned' five-year *Specialist* Diploma).

Specialist or Magistr (Master's level) — second cycle. The duration of Master degree programmes delivered by Russian HEIs is usually two years. Master level programmes offer students a deeper and a wider perspective on related fields of study, and in-depth specialization in their majors. While Bachelor level

programmes are more practice-oriented, Master programmes provide students with competencies they will need for their future research or teaching activities.

Aspirantura ('Training of highly qualified staff', or post-graduate studies) — third cycle. The length of postgraduate training may vary from 3 up to 5 years depending on the profile of the programme. Postgraduate programmes contribute more to students' broader knowledge in pedagogy, methodology, research and development.

Thus, a typical learning path of a graduate can be realized by the following scheme "Bachelor-Master-Training of highly qualified staff" (Federal Centre for Educational Legislation, 2018).

Though the transition of the Russian HE to the three-cycle system is almost complete, approximately one hundred programmes in the specified majors (Medicine, Arts, etc.) still lead to the *Specialist* Diploma, which is a traditional form of Russian/Soviet higher education, comprising basic education with in-depth specialist training in the chosen area. Regular duration of a full-time programme is 5 years, or 6 years in a distance mode.

The Russian National Qualification Framework (NQF) is currently underway, being a subject for a vivid public discussion between the government, academic community, and business. The first project of the Russian NQF was proposed by the Ministry of Education and Science in close cooperation with the Russian Union of Industrialists and Entrepreneurs in 2007. Since then the framework has been publicly debated and approved in the process of devising occupational (Ministry of Labor) and educational standards (Ministry of Education and Science of the Russian Federation). The proposed framework comprises nine levels, compatible with the eight levels of the EQF, while the ninth (additional) level corresponds to the postdoctoral qualification (a *Doktor nauk* degree). Levels six through eight are relevant to the system of higher education in Russia, where *Bakalavr* (Bachelor) corresponds to level 6, and *Magistr* (Master) and Specialist to level 7. The framework also specifies the ways of achieving qualification levels. Each of the qualification levels is characterized by the system of descriptors. Level descriptors fall into the categories of knowledge, skills and competences. These categories are further described in terms of autonomy and responsibility, degree of complexity and knowledge content of a professional activity. The Russian draft NQF mainly serves for the purpose of defining qualification levels as well as for devising occupational standards. Therefore, the learning outcomes as seen in the Russian academic community (and bureaucracy) should be aligned with appropriate occupational standards set by the national Ministry of Labor.

Occupational standard, in turn, determines the qualification an individual should achieve to perform specific kind of a professional activity. The document specifies types of professional activities, general labor functions and qualification

requirements for chosen labor functions; moreover, it gives a description of knowledge, skills and competences a person should have to occupy a specific position.

In the absence of NQF, the quality assurance criteria in the Russian higher education are mainly set by the learning standards, or the Federal State Educational Standards (FSES). The FSES is a mandatory set of criteria (descriptors) for all state accredited educational programmes at all levels, from primary to higher education. The FSES actually shape the contents of education and establish the required quality of its content (curricula and syllabi); the teaching and support staff; the information provision of the teaching and research process (sources of information and different types of available support – printed and electronic – which correspond to the content of course programs as well as means of information transmission, storage and use); the actual knowledge and skills of graduates (minimum requirements in regard to the level of knowledge and skills).

The FSES are a subject to regular renewal; in higher education "Generation 3" standards have been in use since 2009, gradually transferring to the "Generation 3+", and "Generation 4". The "Generation 4" standard is more labor oriented as the part 7 of the Article 11 at the Federal Law "On Education in the Russian Federation' suggests "…the Federal State Educational Standards should be aligned with provisions of relevant occupational standards in terms of professional competences".

The FSES system, however, has some exclusions: ten HEIs having the status of "the Federal University" and twenty-nine "National Research" universities, along with the two biggest and oldest Lomonosov's Moscow State University and St. Petersburg State University enjoy the privilege to develop their own educational standards at all levels of higher education, although their learning standards cannot be below the corresponding requirements of the FSES. At the same time, these three groups of stronger HEIs, along with affiliated representatives of the academic community and employers now develop the FSES.

Thus, despite serious transformations since joining the EHEA, the higher education system of the Russian Federation is still strongly centralized, and gives almost no (if any) autonomy to HEIs in defining learning outcomes of their academic programmes. Even being practice oriented and using modern ways and technical tools of teaching, the existing system is, in most cases, very teacher centered, and constrains dissemination of other Bologna innovations, such as student-centered learning, or student engagement. Under such circumstances, international, especially European inter-university cooperation projects is one of the few windows of opportunity left to experience SCL.

Volga Tech in the REBUS project

Volga State University of Technology (Volga Tech), established in 1932, is a nationally recognized public university under the jurisdiction of the Ministry of Higher Education and Science of the Russian Federation. As a state-run establishment, Volga Tech follows the national guidelines for higher education development policies set by the national (federal) legislation on education, which, in turn, includes Russia's obligations within the framework of the European Higher Education Area and the Bologna process.

Within a changing structure of national higher education system Volga Tech remains its status of a 'regular' public university, operating primarily as a school of engineering, and facing the challenges of stiff competition both at local and national levels, where huge new entities such as Federal and National Research universities started to expand since 2006 and 2009 respectively, having priority funding from the government. Budget cuts for education made the government strengthen its yearly monitoring of HEIs activities and efficiency that also makes regional HEIs be more flexible in their educational and economic policies, and more internationally open. With its student population (2018) of about 9,000 (of whom about 5,000 are full-time, and more than 960 are international) Volga Tech is a mid-sized university, typical for a regional capital city like Yoshkar-Ola (population 260,000). Its structure includes two branches (in small towns Mariinski Posad and Volzhsk), and two autonomous sub-divisions (the Higher College "Polytechnic" and Yoshkar-Ola College of Agriculture), providing academic programmes in professional training (fit to levels 4 and 5 of the EQF and draft NQF of Russia).

As most of the Russian state universities, Volga Tech has accomplished its transition to the three-cycle system (Bachelor-Master-Training of highly qualified staff), and to academic credit system required by the "Generation 3" of FSES. Since 2011, Volga Tech has developed its own model of the European Diploma Supplement to promote mobility of its staff and students (however, like in most of HEIs throughout Russia, it is still issued on demand at the costs of an applicant).

Having a solid background of four implemented Tempus joint European projects (since 2005), and being the very first Russian school of engineering to open its Jean Monnet Center of Excellence (2016), Volga Tech joined the REBUS consortium with a serious intent to widen the scope of applications of the European expertise and practices, as well as to expand the range of its international partnerships (see List of Tempus projects (2019)). The Erasmus+ REBUS project (REady for BUSiness: Integrating and validating practical entrepreneurship skills in engineering and ICT studies) was considered a logical continuation of series of international endeavors – predominantly EU funded – aimed at further integration

into the European Higher Education Area, enhancing the quality of teaching, and gradual turn to the SCL.

REBUS goes student-centered

As Volga Tech always had forestry and environmental science among its study and research priorities, the Master's degree programme "International Cooperation in Forestry and Nature Management" was chosen to perform in a new Erasmus+ capacity building project: a standing out application in comparison with the majority of other REBUS applications from Russia and Western Balkans. The programme teaching staff took part in series of trainings, both online and on-site (in Sarajevo, Vienna, Palermo, and Essen). The core target group comprised 14 students of this particular programme (including 7 internationals – citizens of Uzbekistan).

From the very beginning, it was clear that the REBUS would bring a lot of innovations in the didactic approaches, making the prohramme more student centered. The REBUS component of the Master's programme was aimed to bring the key elements of entrepreneurship and innovation to the programme curricula, partly as 'regular mode' classes (lectures and seminars), and partly in e-learning format, using the computing equipment and software purchased and provided within the project (*Mahara* and *Level 5*). Worthy of note, the REBUS team at Volga Tech actually could not intervene into already existing (linear) curricula of any Master's degree programme; therefore, it was only possible to offer the entrepreneurship related courses and classes only as electives. In practice, some key topics raised within REBUS were quite smoothly incorporated into the syllabi of several subjects, taught almost exclusively by the project team members.

Keeping in mind the focus of all three Master's degree programmes on Environmental Issues, Environment Protection, Forestry and Ecology, etc., the set of themes covered within REBUS should have include eco-tourism, sustainable urban forestry, sustainable forest management, monitoring of environment and natural resources, economics of forest complex (e.g. timber production, forest protection, forest infrastructure), international ecological certification, wildfires monitoring and protection, use of renewable energy sources (e.g. biofuel), and many other. The project team has developed a didactic framework, which implied that by the end of the project students should be able to detect and assess the entrepreneurial opportunities in the field of forestry, nature management, landscape design and architecture. They should have also obtained the skills necessary to implement their own entrepreneurship projects, such as needs analysis, strategic and operational planning, time management, financial issues, other 'soft skills' (proposal writing

and presentation, communication skills (including command in English), team work); basics of copyright and patenting their innovative ideas and products. The successful implementation of students' entrepreneurial project implied they that had mastered their capabilities in the chosen fields of expertise (such as Forestry, Urban Ecosystems, etc.) during their Master's study. As for the attitudes, students were supposed to develop their personal motivation for entrepreneurship and innovation, readiness to risk in developing a new product or service, ability to negotiate and debate on their project proposals, flexibility in decision making and finding compromises in troublesome situations.

Within REBUS a stronger accent was made on individual student projects (with opportunity to choose and adjust the topic individually), and incorporation of entrepreneurial vision and innovative approaches towards Forestry and Nature Management in students' Master's theses. For example, students could consider the possible applications of their project as a core idea of a start-up; for those who took part in international study visit the latter condition was a must.

Needless to say that the use of e-learning tools within the REBUS project was already a good start for trying more student-centered approaches in teaching and learning. Personalization of students' profiles in *Mahara* and *Level 5* platforms give the learners a degree of individual academic freedom and the educational environment for self-expression they could hardly obtain during regular classes at the Institute of Forestry and Nature Management. One should also take into consideration the orientation on an individual project (at the end of the course), and healthy competition for being included into the group for international study visit – in case of Volga Tech, to the University of Duisburg-Essen in Germany.

The international study visit was an intense and exciting enterprise that lasted for 10 days but actually became a life changing experience for eleven Volga Tech students. They worked in international teams (Russian-Bosnian-Albanian-Kosovar), studying various aspects of entrepreneurship, innovation and creativity in relation to their field of knowledge. The educational interaction within the groups and with the teaching coordinator was based on the principles of design thinking - the methodology of creative, rather than analytical solutions for engineering, business and other vitally important spheres.

Every day of the study week was devoted to one stage of design thinking: emphasize – design – ideate – prototype and test. Eventually, students presented their developed, elaborated and tested ideas. So, Volga Tech undergraduates participated in the preparation and public defense of three group projects, one of which, the "Eco-Museum", won a special prize in the nomination "The best project documentation". According to the feedback from the participants, they learned a lot of new and interesting things that they would use in their further work and studies. The REBUS team members from Duisburg-Essen, Sarajevo, and Vienna

have effectively projected their entrepreneurial mindset on students. As a result, something that initially seemed impossible or unrealistic for learners was gradually turned into real, almost ready-to-sell product.

Hence, participation in REBUS studies and international mobility allowed students to learn and put into practice new methods, technologies, approaches, but what is more important, interaction with students from other countries, search for a common solution to the difficulties arising within co-working, operating in a team altogether contribute to the establishment of friendly relations between young people, and therefore, to some extent, between the countries involved. For 40 students who took part in the REBUS study visit (or three times more, taking into account visits to Graz and Palermo), the world will never be the same again – it has become brighter and friendlier.

The SCL Toolkit gives an opportunity to estimate the depth of changes in learning process of the REBUS piloting student group. Using the "SCL Checklist", one can assess if learners are really engaged in consultations on the programme content and methodology used, able to give their feedback on the quality of educational process, have a clear vision on learning outcomes and workload (ECTS compatible), and many other options (altogether 45 descriptors) (ESU, & EI, 2010b, 11-14). Such self-assessment shows that fundamental principles of student-centered learning are already in use with REBUS students, if not at the university level but at programme and classroom level.

Conclusions

Implementing the REBUS project in a mid-sized Russian engineering university like Volga Tech has brought to light serious problems, albeit quite typical for a country, which higher education system is still in transition towards the EHEA, and where principles of SCL are still not in the focus of the national Ministry of Higher Education and Science. Previous Tempus experience of the university project team was of a great value when used in the newly designed Erasmus+ capacity building framework. Measuring the efficiency of the REBUS project should not only include formal outcomes (such as statistics on mobility flows, number of new courses and publications, units of technical equipment purchased, etc.). A project focused on entrepreneurship and innovation must also stress upon intangible outcomes: networking, development of a corporate or professional community culture, changes in attitude and mind set. This is what Erasmus+ has been designed and is working for.

Placing students in the center of the REBUS teaching of entrepreneurship and innovation was probably the most challenging – both mentally and technically – and

the most exciting part of the project. Strongly supported by the European partners, Volga Tech has developed new patterns of interaction in the classroom, and new organizational models of student research and practice. At least thirty students went through REBUS related courses, of whom eleven used their opportunity to study in Europe, although for a short while. However, as student feedback shows, for many of them it was a life changing experience. Moreover, engaging not only Russian (domestic) but also Uzbekistani (international) students into the REBUS activities, and giving them a unique chance to be placed in the center of study process, Volga Tech has promoted dissimination of SCL in Central Asia.

Indeed, Volga Tech – or, at least, the REBUS team – has experienced a true *capacity building*, as during the course of the project all teachers, administrators and students involved have increased their capacities in programme planning, course design, use of distance learning tools, foreign languages, to say nothing about intercultural communications. Some of the key REBUS elements, such as unique modes of (self) validation of entrepreneurial skills and competences, represented a novelty for Volga Tech, even though the Volga State University of Technology enjoys the reputation of one of the most advanced HEIs throughout the Russian Federation in using e-learning tools and technologies.

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