Integrated approach to teaching ESP based on MOOCs

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Keywords: Engineering education, foreign languages, MOOC

INTRODUCTION

In this article the authors propose a way to organise an essentially new approach to teaching foreign languages based on Massive Open Online Courses. MOOCs are considered as a didactic tool where engineering content is provided in a foreign language, which offers a unique opportunity for non-English speaking technical schools to build a naturally integrated course of a foreign language for specific purposes. In January 2014, Tomsk Polytechnic University in Russia initiated an experiment aimed at testing the didactic potential of MOOCs in ESP courses. The project attracted great interest of the University community and proved efficiency of using MOOCs as a new educational tool for teaching English for Specific Purposes to engineering students.

1 BACKGROUND AND FOCUS

1.1 Need for change

Recent changes on the global labour market provoked revision of requirements to qualification of a modern engineer. Nowadays, the desired attributes of an engineering graduate include not only professional knowledge, but also high-level communication skills. Engineering education in countries where the native language is not English – such as Russia – is also affected by the need to develop foreign language skills to increase competitiveness of their graduates in modern society. The importance of learning foreign languages as well as of the ability to apply them in technical communication has increased dramatically.

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The intensive globalisation of the engineering society has led to significant changes in Russian educational standards in the last decade. This governmental attempt is aimed at reformation of the national system of higher education in view of the newly-defined desired attributes of engineers. National legislation obliges Russian universities to modify their programmes in compliance with the new standards. Along with the natural ambition of higher educational institution to prepare globally competitive specialists, the Law on Education in the Russian Federation additionally motivates the rapid need in essentially new approaches to training engineers.

The new vision of engineering education is to provide the learning where students can attain the desired outcomes, which reflect not only subject-oriented knowledge but also personal skills and the ability to effectively communicate with an opponent, a customer or a partner. In this endeavour the importance of systematic inclusion of foreign languages into curricular in Russian technical universities rises to the top of the list as English is consistently replacing all other languages on the globe and becomes an international language.

1.2 Present-day context of teaching foreign languages to engineering students in Russian universities

Being an isolated element, language education is currently focused on different goals and principles of professional training compared to other subject-oriented courses within engineering programmes in Russia. Unfortunately, any urgent attempts to find new solutions that can be observed in national institutions of higher engineering education usually result in the increase of academic workload and are often non-cost-effective in the conditions of intensification of engineering curricular. In addition to the need to focus on the content of engineering and develop students' professional competences, some other key factors that influence teaching foreign languages at Russian engineering universities include:

- Drop in classroom load. Since the fall of the Iron Curtain in early 1990s and the sudden realisation of the need for communication with other countries, the amount of foreign language courses has been a matter of a continuous debate in Russian higher school. Top national universities – such as Tomsk Polytechnic University – pioneered many new approaches towards communicative expertise of their graduates, significant increase of the language workload in non-linguistic programmes being one of the mainstreams [1, 2]. Until recently students could have up to 450 academic hours of mandatory foreign language courses per year [3]. Although this practice provoked a sharp rise in overall communication competence, it greatly overloaded students who asked for revision of engineering programmes in favour of technical knowledge and applied skills. A modern trend indicates a steep decline in foreign language load within engineering curricular and a resulting uncertain position of the humanities in the training of technical specialists.
- Shortage of qualified educators. Traditionally, foreign language teachers in Russian universities account for up to 100% non-native speakers [4]. Out of nearly 7% of international educators in the total teacher population at Tomsk Polytechnic University none is employed by foreign language departments. Though some scholars consider non-native English speaking teachers to be potentially the ideal ESL teachers for beginner and elementary learners [5], the advantage of a native speaker of the non-native one is obvious with regard to professional communication. In fact, the demand for native English speaking teachers is so strong that most schools will hire them without any teaching qualifications.

- Need for extrinsic motivation. Many Russian students have a blurred understanding of the need to learn foreign languages [6]. Although it is broadly recognised that there are many reasons why good communication skills in foreign languages are crucial in the globalised world, they have insufficient effect in countries where the labour market is primarily native speaking. In the conditions of low intrinsic motivation, concentration on learning languages is commonly based on students' professional interests and engagement as the main learning drivers.

1.3 Modern trends in teaching foreign languages

Although urgent attempts to find new solutions are observed in Russian institutions of higher engineering education, the current language courses are not integrated into engineering curricular to the extent that could increase global competitiveness and successful international careers for their graduates. Most modern trends in teaching foreign languages in Russian engineering schools can be classified in three groups based on the magnitude of the resulting change and their ability to affect the overall organisation and outcomes of engineering education:

- Development of individual techniques and technologies aimed at intensification of courses to improve the efficiency of acquiring linguistic knowledge and skills. Initially stimulated by the decline in workload, recently new methods have also addressed the motivation problem. Some latest solutions in teaching foreign languages in Russian engineering schools adapt gamification approaches and interactive techniques. Blended learning and application of computer technology in general are also viewed as a means to redistribute the load and move some topics outside classrooms.
- Launching courses that are not directly aimed at improving language skills but focus on teaching students communicative strategies in discipline-related situations, e.g. negotiations, debating, making a presentation, academic writing, etc. Such courses are strongly based on competence approach and incorporate active learning.
- Teaching basics of technical disciplines in a foreign language. This is a variation of the so-called immersion model, in which a foreign language is used not only as course content but also as a means of attaining new knowledge and skills [7]. Due to the shortage of engineering professors with high foreign language skills in Russia, this practice is often implemented in cooperation of professors of engineering departments and linguists who combine their expertise in the subject field and the target language. Content of such courses is the sole responsibility of engineering departments while linguists use the selected topics to teach vocabulary, constructions, genre and even translation. Despite successful results in several universities, this approach is resource-intensive, thus Russian schools usually give preference to other solutions.

It should be noted that none of the described trends provide the necessary degree of integration of different engineering competences that would meet the needs of a modern society. This is primarily due to the lack of conformity in development of professional knowledge and language skills in the conditions of Russian higher school. In addition, many students do not see the prospects of using a foreign language in their professional activities, since the educational process is not filled with personal meaning and is often divorced from the professional reality.

2 MOOCS AS A BASE ELEMENT IN LANGUAGE IMMERSION

2.1 Didactic potential of MOOCs

When Massive Open Online Courses first appeared less than 10 years ago, they indicated a revolution in education. Since then MOOCs gained reputation among students so rapidly, that many universities worldwide considered their potential in online and open education as MOOCs turned an effective tool for institutional branding. Nowadays discussion also arose on how MOOCs can be used towards a traditional degree. Especially in developing countries integration of open online courses into conventional curricular is one of the desirable options.

Along with multiple general academic strengths, MOOCs possess a range of characteristics that let us consider them as a powerful instructional tool for learning ESP in non-English-speaking countries, despite the fact that most online courses were not designed as a means to develop language skills. First of all, English is the most common language in currently existing MOOCs, more than 50% of which popularise technical and engineering disciplines. Besides, MOOCs are produced by many world's best universities, such as Stanford, Harvard, MIT, etc. – the fact that not only guarantees high quality of content but also additionally motivates students for learning. Several common components and didactic principles directly contribute to active use of the course native language, among them:

- discussion boards, wikis and blogs where students may discuss new concepts and phenomena,
- forums and chat room monitored by a course instructor,
- peer assessment when students are asked to assess and comment on random written works by other students.

2.2 Case study

In January 2014, Tomsk Polytechnic University in Russia initiated an experiment aimed at testing the didactic potential of MOOCs in ESP courses. The project was carried out at 2 institutes of the University and collected results from 84 students and 10 professors. The experiment process used the MOOCs shown in Table 1 below that were chosen jointly by the language and engineering teachers as well as the students. Data collection technique included student satisfaction survey and instructor reflective reports; then, evidence and results were discussed at a meeting of the Methodology Council of the University.

Table 1. List of selected MOOCs

Platform	MOOC	Number of participants	Academic year (B – bachelor programme, M – master programme)
Coursera	Introduction to Household Water Treatment and Safe Storage	16	B3
Coursera	Developing Innovative Ideas for New Companies: The First Step in Entrepreneurship	5	B4
Coursera	Understanding Europe: Why It Matters and What It Can Offer You	3	B4

Coursera	Corporate Finance Essentials	2	B4
Coursera	Gamification	1	M1
Coursera	Globalisation of Business Enterprise	1	B4
Coursera	Early Renaissance Architecture in Italy: from Alberti to Bramante	1	B4
Coursera	Managing Fashion and Luxury Companies	1	B4
Open2Study	Human Resources	23	B3, B4
Open2Study	Innovation for Powerful Outcomes	19	B2, B3, B4
Open2Study	Management for a Competitive Edge	6	B3, B4, M1, M2
Open2Study	Financial Planning	3	B1, B3
Open2Study	Online Advertising	2	B3
Open2Study	Leadership: Identity, Influence and Power	1	B4

The educational process was organised as a combination of online students' learning and weekly meetings with course teachers who coordinated students' work and provided additional support through discussion, advising and regular monitoring. Both language and engineering faculty were involved. Engineering faculty members shortlisted courses that fitted programme outcomes, participated in group discussions, consulted students on course assignments and held final tests. ESP instructors helped students with selection of courses of appropriate language level, organised and conducted group discussions in English, recorded formative and summative assessment results.

2.3 Data analysis and discussion

Within one week following the experiment evaluation data was collected through instructor reflective reports and a student satisfaction survey. The instructors were asked to describe strengths, limitations and didactic potential of MOOCs for teaching ESP. The participating teachers highly appraised MOOCs and their didactic potential for clear and logical structure, authenticity of materials, accessibility, immediate feedback and additional motivation to students through award of certificates in case of successful completion. Besides, the teachers referred to flexibility of the courses, which respected students' individual learning styles in terms of tempo, time, place and duration of each session. The following strengths and limitations were additionally identified:

Strengths of using MOOCs in teaching ESP:

- Open online courses can be used for unsupervised students' learning.
- High-quality content and access to international community serve as additional stimuli for completion of the courses.
- Integration of engineering content and the target language expands students' professional vocabulary and communication skills.
- Embedded measuring tools ensure unbiased assessment of students' achievements.

Limitations of using MOOCs in teaching ESP:

- There is no tool that allows simultaneous selection of MOOCs through different platforms.
- Unknown recurrence of the courses hampers their integration with Russian engineering programmes that lack flexibility.
- Many MOOCs are limited by copyright.
- Most MOOCs provide basic knowledge of the subject and cannot be used at a master level.

The student satisfaction survey questionnaire was designed around two primary objectives: (1) to evaluate students' opinion on the efficiency of using MOOCs to learn ESP and (2) to collect appropriate data on the main difficulties students faced in this type of learning. Figures 1-5 below show quantitative results of the survey.

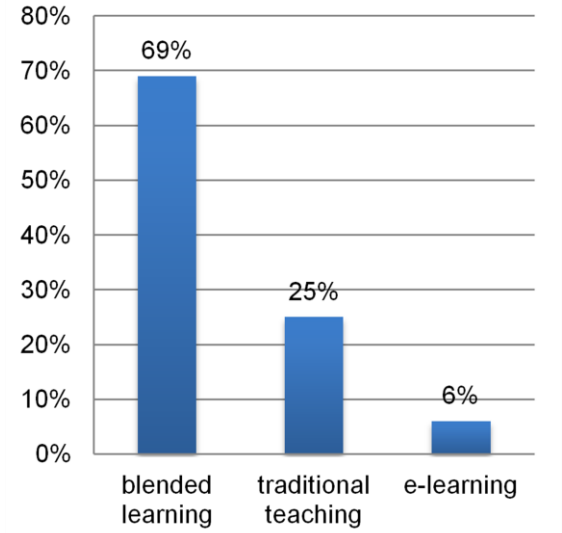

Fig. 1. Preferred approach to learning ESP

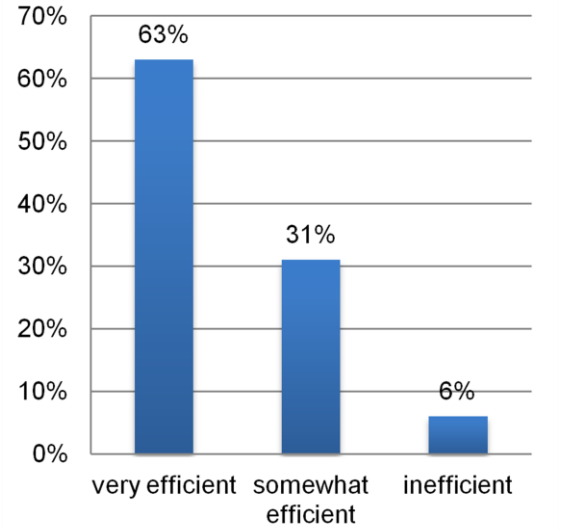

Fig. 2. Efficiency of using MOOCs in learning ESP

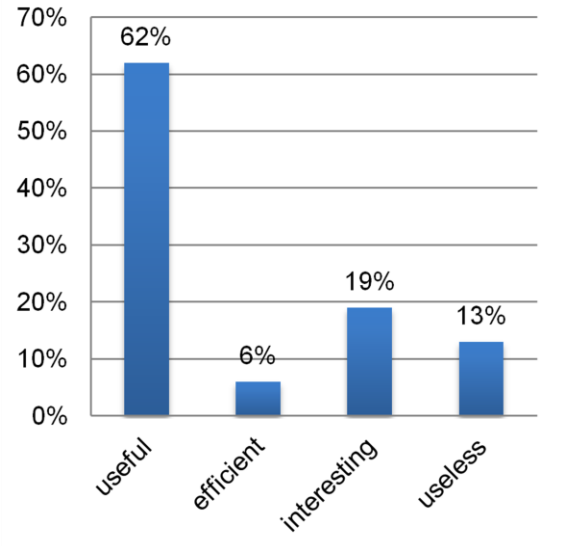

Fig. 3. Overall impression from MOOC-based ESP learning

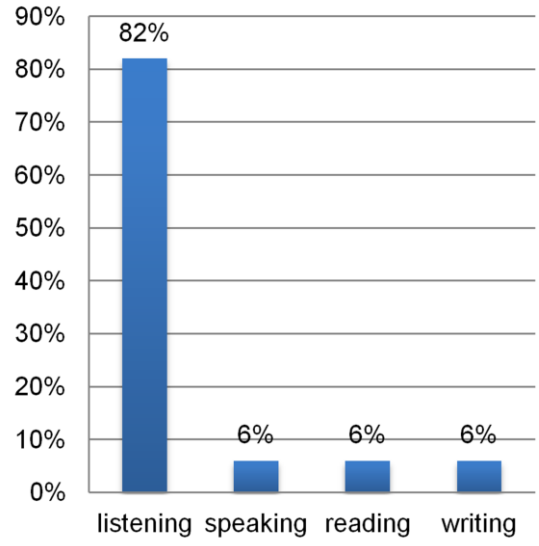

Fig. 4. Efficiency of MOOCs in training different language skills

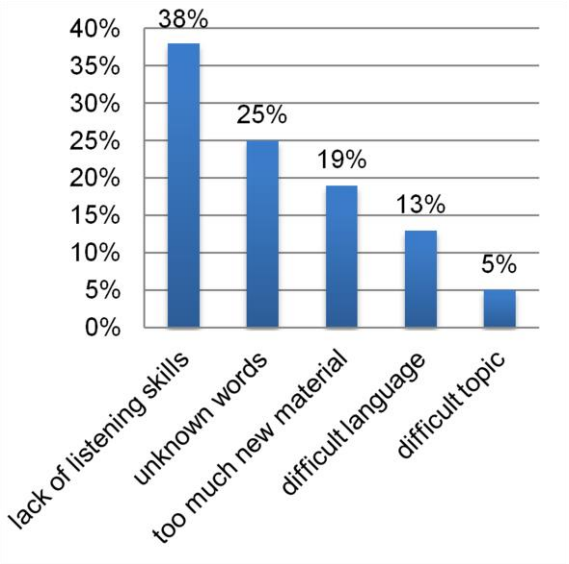

Fig. 5. Major difficulties

The experimental results proved that MOOCs have the potential to eliminate the key factors that have a negative influence on language education in Russian engineering universities. The described approach is content-based and allows development of both professional attributes and foreign language skills in an integrated manner. Transfer of a significant portion of assignments from face-to-face to online environment reduces teachers' workload and develops students' motivation and self-organisation. Although students demonstrated an overall high level of satisfaction from the experimental practice, the lack of language competence, mainly listening and writing skills, required additional attention from the language instructors. Besides, group seminars and individual meetings with engineering staff members appeared very popular elements of the course. These results and approaches are consistent with prior research on the importance of instructor presence for successful online learning. The data collected from the student satisfaction survey and instructor reflective reports suggest that MOOCs will be most efficient in blended learning and for elimination of academic debts.

3 CONCLUSIONS

The described experiment triggered great interest of Tomsk Polytechnic University community and proved efficiency of using MOOCs as a new educational tool for teaching English for Specific Purposes to engineering students. The use of MOOCs in conventional curricular contributes to creation of the environment where foreign language skills are genially integrated with professional knowledge. Learning from world leading universities provides students with a challenging and exciting international experience, teaches them understand different cultures and motivates for further learning. The proposed practice suggests flexibility and personalisation of teaching and learning.

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