TEACHING FOREIGN LANGUAGES TO ENGINEERS: MASSIVE OPEN ONLINE COURSES (MOOC)

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Abstract *The paper represents the massive open online course (MOOC) that is supposed to be the part of professional communicative education of engineers on the example of teaching Russian language as a foreign language. MOOCs for teaching foreign languages have their benefits. A person may get the foreign language education in any corner of the world. The results of the achievement test that were given to the students show that the MOOC-based training is more effective than the traditional training. The interviews with the engineers show that the MOOC-technology motivates their activity and that they would rather choose online learning than the classroom one.*

Keywords: MOOC, Massive Open Online Courses, teaching foreign languages to engineers, foreign engineers, e-education

INTRODUCTION

In the digitalization era, the communication between people has changed significantly. Generation Z which is currently studying in schools and universities, do not have the faintest idea what life was like without gadgets. They often spend most of the time in the media space with a smartphone or tablet but not a book. They watch films, quote them, create memes, analyze them, shoot video clips, post them on social networks, follow the latest news of bloggers and often run their blogs, in which they post media texts of their own composition. All this makes them plunge into a parallel reality, where the boundaries between the real and the virtual world, between real life and the screen are blurred.

As the experience of teaching a foreign language shows, our students often have difficulties in the perception and understanding the professionally oriented texts with a verbal linear structure. They seem to them complex and uninteresting. They understand texts with audio-visual support much faster.

Aiming to raise the effectiveness of foreign language instruction, teachers have to use different digital technologies in the process of teaching a foreign language. The transition to online mode is obvious and necessary.

1. THE STAGES OF PROFESSIONAL-COMMUNICATIVE DEVELOPMENT OF ENGINEERS

The professional-communicative development of foreign engineers in Russia may be represented as a lifelong process, regardless of whether a specialist receives methodically organized educational support after graduation or independently learns new terms, or adopts new textual genres, in other words, is engaged in professional-communicative self-education. In this incremental advance, in the continuous professional-communicative development of a specialist, the reference points are clearly marked when the goals and content, format and technologies of linguistic education are changed. This allows us to talk about the structuredness of this process, i.e., a systematically organized set of component stages in teaching foreign languages to engineers. These stages are as follows:

— Pre-university education of foreign students in Russian technical universities – *the pre-university stage of teaching Russian to foreign engineers*;

— development of foreign students during their studies in technical educational institutions of the Russian Federation – *the university (main) stage of teaching Russian to foreign engineers*;

— Post-university professional-communicative education of foreign students – *the post-university stage of teaching Russian to foreign engineers*.

At each stage of teaching a foreign language in accordance with modern educational trends aimed at its digitalization, it seems useful for students to conduct independent networking using open educational resources, remote interaction with lecturers and tutors, discussions of professional problems through video interaction, collective network communication (on forums, chats and weblogs) as well as study recorded lectures off-line and view training videos. These technologies can be implemented as part of a MOOC developed by teachers.

When teaching a foreign language, in our opinion, the most optimal means of linguistic education support will be using a massive open online course (MOOC) at any stage of teaching Russian as a foreign language to students who are going to become engineers, since special requirements are imposed on the forms and means of communicative development of a student. Firstly, they must provide effective and targeted linguistic education support for students. As a rule, engineers have no

time and opportunity to improve their skills of professional communication in extensive mode. In addition, training at this stage is performed on an individual educational route; therefore, it is necessary to determine the actual starting level of foreign language proficiency of each student, to reveal his or her "personal" problems in the sphere of professional communication, and to take into account the peculiarities of his or her educational activity in the learning process. Secondly, it should be kept in mind that, at this stage, a foreign language may be learnt outside the language environment: an engineer who has graduated from a university in Russia leaves it to continue working in his own country but he needs to learn Russian as a foreign language to be able to communicate with Russian colleagues. Thirdly, training resources need to be somehow "transported" to the addressee. Finally, it is necessary to manage the educational process and check the outcomes. The "paper" format of traditional training tools is unlikely to help solve all these problems.

In order to develop a MOOC, it is necessary to know what it is and what structure it has.

2. LITERATURE REVIEW

There are numerous studies covering various theoretical and practical aspects of the development, introduction and implementation of MOOCs.

Nour Albelbisi, Farrah Dina Yusop , Umi Kalsum Mohd Salleh say that MOOC is a new online learning style with significant capability to expand free online courses to a large number of participants worldwide (Albelbisi, Yusop, Salleh, 2018). M. Ebner, E. Lackner, M. M. Kopp consider MOOCs as a trend phenomenon in electronic education (Ebner, Lackner, Kopp, 2014: 216).

V.N. Kukharenko emphasizes that a MOOC is "based on the active participation of hundreds and thousands of students who themselves organize their interaction in accordance with the training objectives, background knowledge and skills as well as common interests" (Kukharenko, 2011: 94).

Some authors describe MOOCs as "online courses with interactive participation and open access" (Lebedeva, 2015: 105), which, being the "highest point of modern e-learning, can give rise to the formation of professional online communities as well as to the expansion of international contacts among teachers of higher educational institutions" (Bugachuk, 2013: 154).

S. Alumu and P. Thiagarajan describe MOOCs most fully. In their opinion, MOOCs are a form of e-learning based on an open (public) Internet course using electronic educational multimedia content, interactive user communication and support of the community of teachers, assistants and students, with massive participation of the latter (Alumu & Thiagarajan, 2016).

S. Tang comes to the conclusion that the teaching mode of MOOC is divided into three kinds: MOOC based on content, MOOC based on network and MOOC based on task. Compared with the traditional courses, MOOC has intrinsic characteristics such as a large scale, openness, networking, personalized and participation, which includes the online learning effectiveness, the mastery learning, the interactive cooperation and the learning mechanism of complex system self-organization core (Tang, 2017).

In teaching foreign languages MOOCs play an important role. R. J. Blake and G. A. Guillen stress that as a foreign language online course MOOC includes the four major benefits of online language learning for learners: (a) flexibility, (b) personalization, (c) autonomy, and (d) automation (Blake & Guillen, 2014).

It is true because a person may get the foreign language education in any corner of the world. The courses are usually made up so that their content meets any student's level. Moreover, the participants study individually, so they can take their individual route of studying. Finally, automation influences well on the student as well because he can get immediate feedback in most cases. He doesn't need to wait until the teacher checks the paper.

3. THE STRUCTURE OF A MOOC FOR THE POSTGRADUATE STAGE OF FOREIGN LANGUAGE TEACHING TO ENGINEERS

As previously noted, the most optimal form of teaching Russian as a foreign language to these students will be a massive open online course.

There are many MOOCs on the Internet devoted to teaching Russian as a foreign language.

At the Coursera platform one may find many courses devoted to teaching General Russian at different levels. Their structure is different. It contains videofragments for learning, authentic texts for reading, grammar exercises and tests, some tasks for speaking (https://www.coursera.org/learn/russkiy-b2, https://www.coursera.org/learn/rki-b1-2).

If we analyze the courses at EdX platform on teaching Russian as a foreign language we will see not so many of them. There is a course that helps to form the skills of written scientific language. It contains videofragments and grammar exercises and tests (https://www.edx.org/course/mephix-mephi010x). The course "We learn to write scientific articles" helps the students learn how to write articles, to know the structure of it, to write an abstract, to make an article shorter (https://www.edx.org/course/Учимся-писать-научные-статьи-на-русском).

The analysis of the MOOCs shows that the goal and the structure of every course is different. Some courses are made to teach general Russian, not the professional engineering language. And some of them are devoted to develop the skills of written language. None of them do not match the requirments for future engineers

that have to be able to talk on professional topics, to be able to translale technical texts and many other things.

The MOOC "Russian for foreign engineers", developed by the Russian Language Department, Peoples' Friendship University of Russia (RUDN University), became a pilot project of postgraduate linguistic education support for foreign engineers.

In accordance with the educational needs of foreign engineers, this course includes the following three modules: "Revising Russian grammar", "Reading and listening to engineering news", "Reading and translating technical texts" (for English speakers). An analysis of the most popular foreign platforms (Coursera, EdX, FutureLearn) hosting foreign language courses, allowed us to choose an optimal structure for the modules. Each module of the MOOC includes:

1. ***The organizational unit*** – a component for organizational, methodological and consultative purposes. This unit contains information and basic documents on how to organize and conduct the course, namely:

— An introduction with a brief description of the course;

— Information about the authors and teachers of the course;

— A class schedule;

— A training program (which lists the topics and the number of study hours (per week) allocated for each topic);

— Requirements for the students: A starting level of Russian language as foreign proficiency; technical means to be available for the successful mastering of the course program;

— Planned educational outcomes;

— A general glossary of the course, containing a list of key terms and concepts used;

— A "message board".

2. ***The information-training unit,*** which presents educational information necessary for adopting didactic units of the course. The unit contains specially selected and arranged linguistic educational resources. The organizational and informative "core" of the unit is composed of video materials "reconstructing" the language environment in real time as well as multimedia presentations. These video clips last from 3 to 10 minutes. Each video is accompanied by a set of interactive tasks. The tasks of video clips vary in different modules. In the module "Repeating Russian grammar", the purpose of the video clips is to give samples of using grammatical forms in discourse, first of all, those that are typical of engineering professional communication. In the module "Reading and listening to engineering news", the video clips serve as a means of developing listening skills in the field of professional engineering communication. The video clips of the

module "Reading and translating technical texts" contain brief lectures and instructions on the most complex issues of professional translation. Each video is accompanied by presentations reflecting its subject and visualizing information, which increases the effectiveness of acquiring the necessary knowledge, abilities and skills. The video clips of the modules "Revising Russian grammar" and "Reading and listening to engineering news" are provided with subtitles to facilitate perception of the educational material and promote the interrelated development of students' competence in the main types of speech activity.

3. ***The training-practical unit,*** which contains tasks aimed at consolidating the acquired knowledge, correcting, forming and developing the necessary skills and abilities. Types of training tasks in each module are different: they correspond to its main purpose. For example, the module "Revising Russian grammar" contains tasks aimed at (a) making up correct grammatical forms; and (b) using adequate grammatical forms in speech. The module "Reading and translating technical texts (for English speakers)" contains a micro-system of exercises aimed at (a) training skills in translating Russian language phenomena that are absent in English; (b) training skills in translating English language phenomena that are absent in Russian; c) studying the basic aspects of translation activities; d) adopting the basic methods of translation, etc. These training tasks include macro- and microtexts to observe language units functioning in discourse. The potential of educational platforms makes it possible to include in the course micro- and macro tests, upload files with tasks, create an external link to other sites or an internal link within the educational platform, based on which the MOOC is created. Using the external and internal links in each unit, it is possible to connect additional training materials: additional lexical and grammatical tasks with online checking, texts for reading with assignments for understanding control, links to additional video clips, online dictionaries, and the MOOC glossary. We used all possible components of the content.

4. ***The controlling unit*** for checking how the course topics are learnt. The unit contains tests for the current, intermediate and final control using the techniques of self- and peer evaluations of the performed work. The control materials are multiple-choice tests, close tests, matching tests, etc. The tasks for peer evaluations (i.e., reviewing another student's work) are relatively new; therefore, students are given instructions on how to perform them and which points to be noted. Tasks of this type allow us to develop not only critical thinking of students, but also to study the subject of the module more deeply, and also to fully apply the acquired knowledge, skills and abilities in practice. Peer evaluations also help introduce a competitive factor into the coursework and provide feedback from other participants. Similar assignments also allow students to determine their own level of Russian language proficiency, compare it with the levels of other students, greatly enhancing their motivation and thereby increasing the quality of professional-communicative training. In performing peer evaluation tasks, students are offered essays written by their peers. Using the built-in editor of the educational

platform, students proofread the essays to be checked. Then the teacher checks the quality of proofreading and assigns scores for the completed tasks. Before evaluating the work of their peers, students have to write their own essays on a similar topic. Their essays are passed on to other students for checking. At the end of the course, students carry out the final test, which includes assignments covering all the course topics. After that, students receive the final grades for the passed course.

5. ***The communication unit*** provides communication between the course participants (i.e., students and their teachers) in synchronous and asynchronous modes. This unit helps realize in practice the idea of creating a virtual community of students and teachers. As a result, a linguocultural learning environment is simulated, where the participants communicate in the target language. The MOOC includes asynchronous and synchronous tools. The synchronous tools provide online communication between students and teachers, whereas the asynchronous tools are used for offline communication.

The asynchronous tools include "Forum", where the course participants and teachers can discuss issues arising in the learning process. "Forum" provides interactivity of the linguistic education process, makes it possible to clarify difficult aspects of the program and provide students with targeted consultative support. This tool also contributes to developing discussion communication skills: in formulating and substantiating one's own point of view; correctly requesting information; clarifying, agreeing or refuting the interlocutor's opinion, etc.

The second asynchronous tool of the course is "Survey". This tool is used for providing feedback to students. It allows teachers to receive students' opinions about the course organization and conduct. Using this tool, it is also possible to vote on a certain problem. This tool allows the course to be modified or adjusted in accordance with the real educational needs of students. It is also possible to conduct a survey on the course outcomes in order to see whether it was interesting and useful for students, what difficulties they encountered during the coursework, etc. The asynchronous resource, "E-mail", performs the functions of communication (between teachers and students on coursework issues), instruction (sending news and assignments), control (students' delivery of completed assignments and projects) and some others.

The synchronous tools include "Instant online messaging". This element is used as a means of quick communication with individual students in cases where it is necessary to correct an error or comment on someone's statement.

The MOOC also allows for online video-communication between teachers and students. This function is performed by the "Webinar" tool, which is prearranged in the course schedule. The goals of webinars are different. Thus, webinars were introduced into all the modules: as consultations before the final control and practical classes conducted as discussions of topic-related issues. We deemed it necessary to include a webinar consultation in order to explain in detail the format

of the final control and answer all possible questions related to its organization and conduct. It seems to us that in this way it is possible to prevent unjustified loss of the students' points, which may be caused by a lack of understanding of the purpose or format of the control.

4. METHODS AND RESULTS

The pilot MOOC-based training was conducted on the basis of the Peoples' Friendship of Russia. It involved 63 engineering residents from different countries (South Africa, Iran and China) with B2 level of RFL proficiency. The students were offered either to study the three course modules in a traditional way or register and study them online. Forty-two students preferred studying online. During the experiment, the students were offered to take a test to check their knowledge, skills and abilities. The test included three subtests. Subtest 1 was based on the materials studied in the module "Revising Russian grammar". Subtest 2 involved the materials of the module "Reading and listening engineering news". And Subtest 3 covered the module "Reading and translating technical texts (for English speakers)".Figure 1 presents the average results of the students who studied online and those of the students trained in a traditional way, respectively.

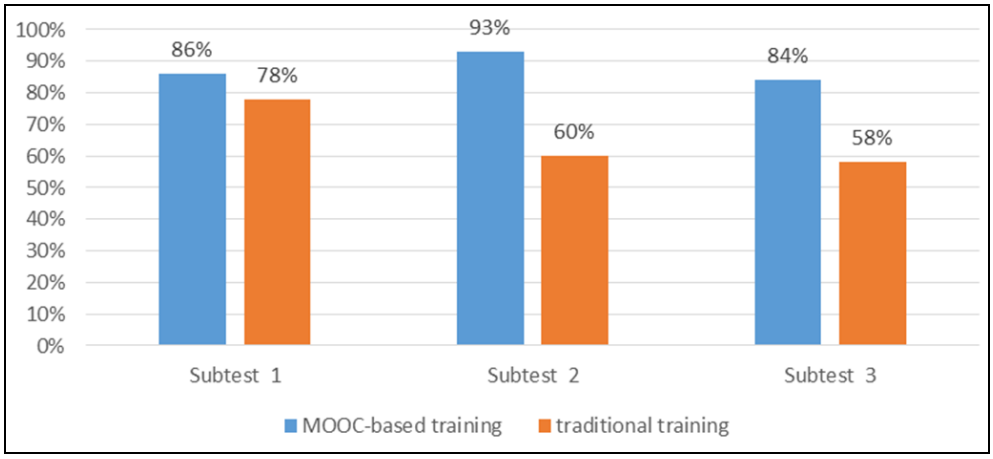

Figure 1. Testing results

Source: Own work

After the completion of the pilot MOOC, the students were asked to assess the degree of their agreement with some statements that would reveal the level of motivation of those who passed the online course. Statement 1: My proficiency in the Russian language has improved in the process of studying the online course; Statement 2: I believe that I have reached the set goals in the course of studying this course; Statement 3: The online component should be included in the TRFL course at all stages on a regular basis. When answering, the students assessed the

degree of their agreement or disagreement with each statement on the Likert scale as follows:

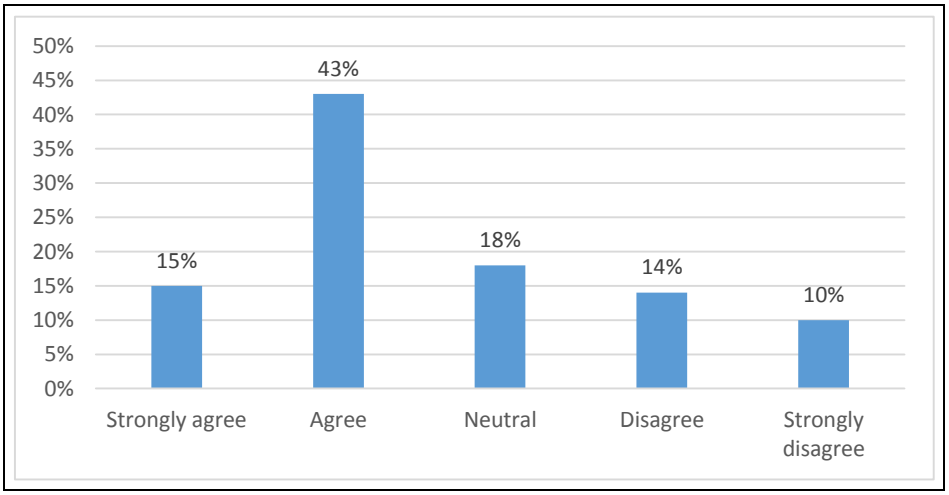

Figure 2. Students' achievements in studying the Russian language online.

Source: Own work

As for the students' opinions about their achieving the set goals, we obtained the following outcomes (see Figure 3):

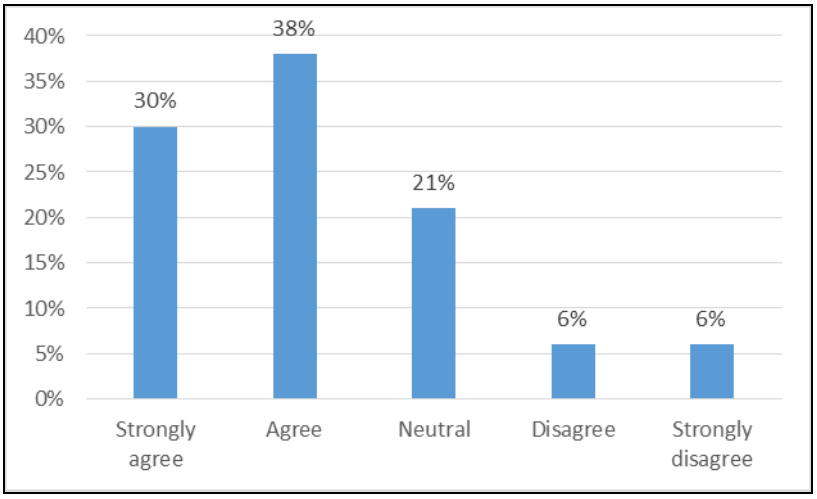

Figure 3. Achieving the set goals based on the online learning outcomes.

Source: Own work

As for the students' opinions about the need to include an online course in all training stages on a regular basis, the following answers were received (see Figure 4):

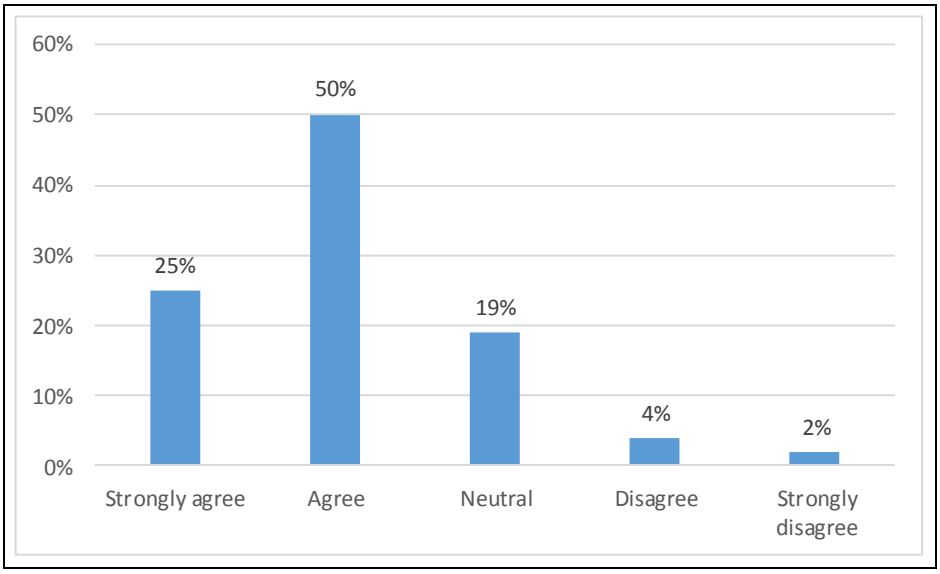

Figure 4. The need to include an online component in all training stages

Source: Own work

CONCLUSION

Thus, the MOOC "Russian language for foreign engineers", targeted at continuous professional-communicative support for foreign specialists outside the Russian Federation includes: *organizational, information-training, training-practical, controlling, and communication units.*

New findings of the study

We believe that a MOOC-based training program will provide:

— Individualization of professional-communicative support for foreign engineers and their educational autonomy; students' access to the course at their convenience;

— Wide geography and massive professional-communicative support; a possibility of interacting with listeners from different parts of the world;

— A sufficiently large bank of resources on topics of interest;

— An opportunity to develop grammatical and lexical skills in all types of speech activity;

— Increasing interest in learning by attracting innovative educational technologies and tools, thus providing the necessary motivation for students and, as a result, improving the quality of education.

The described pilot MOOC demonstrated a wide range of online learning opportunities and, in fact, a possibility of involving an unlimited number of participants in the educational process organized in this way.

The results obtained from the studies and the conducted testments can be used for preparing lectures on teaching professional Russian as a foreign language and developing the massive open online courses for other specialists to be able to form the commincative competency of a foreign specialist.

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WEBSITES

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EdX https://www.edx.org/

FutureLearn https://www.futurelearn.com/