Integrating Massive Open Online Courses in the ESP Programs for Students of GeoScience

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Abstract

Massive Open Online Courses (MOOCs) have been applied at the university level in various forms worldwide. However, not enough attention has been paid to this educational resource in the area of teaching English for Specific Purposes (ESP) for students of the earth science. The paper consideres the methodological and educational potential of the MOOCs for students of geological disciplines and offers innovative ways of intergrating this pedagogical resource in the ESP programs. The use of such free resources proves to be a certain advantage for Russian lecturers and their students since it provides an opportunity to search for and select new up-to-date materials. It discusses a possibility to create own MOOCs that are best suited for educational purposes locally and internationally.

Keywords: massive open online courses, integration, geoscience students, English for Specific Purposes

Introduction

Massive Open Online Courses (MOOCs) have been applied at the university level in various forms worldwide since 2008. However, not enough attention has been paid to this type of educational resources in Russian higher schools of learning, especially in the area of teaching ESP (English for Specific Purposes) to students of the earth science.

A comparative analysis of a number of textbooks used by English teachers from Russia revealed that they are largely oriented towards translation of theoretical materials rather than real life communication in a professional field. For example, in the ESP textbook for students of mining and geological specialties, the focus is on reading and translation of original literature on mining, annotation and abstracting articles on mining topics (Delieva et al. 2015). English for Petroleum Geo-students Teaching manual is aimed at forming skills in reading authentic literature on petroleum geology and discussing the relative topics using colloquial and terminological lexis. (Soukhanova 2009; Zhuravleva 2011; Kitkova and Safyannikova 2006). Thus by the end of the ESP course geo sicence students are supposed to master the terminological vocabulary, reading and understanding texts on geology and acquire basic skills in speaking on geo scientific and technical topics.

Another drawback of the conventional approach is a lack of interdisciplinary interaction between related sciences, namely geology, hydrology, ecology, biology, chemistry and physics, social sciences and environmental issues. Thus, new types of teaching materials for educating Bachelor, Master and postgraduate students are necessary to develop.

At the same time, we argue that there should be a balance between language learning and the content. MOOCs are designed for developing both language skills and expanding the learners' knowledge in a particular subject area. Here we use the term CLIL (Content and Language Integrated Learning) as an HE (Higher Education) approach in which some form of specific and academic language support is offered to students in order to facilitate their learning of the content through the English language. Whereas materials provided by online courses can be still teacher-centered or content-based, we consider MOOCs to be truly learner-centered in our case since students have a privilege to choose what courses they prefer to study as furure professionals.

In this paper we consider a project of integrating MOOCs as an innovative educational ESP tool based on the learner-centered approach, cognitivism and connectivism in the digital era. The learner-centered or student-centered approach includes methods of teaching that shift the focus of instruction from the teacher to the student. The students and the teachers become partners in the learning/teachering process. The primary goal of the teacher is to facilitate students' learning and comprehension of the subject material. We fully agree with Nunan's view on learner-centeredness, who says that "it is a matter of educating learners so that they can gradually assume greater responsibility for their own learning." (Nunan 2012).

Some other features according to this approach are as follows: 1) Students work harder than teachers. Students do a lot of tasks on their own outside the classroom. 2) Students apply new learning to real-life, authentic experiences. Classes focus more on skills that you can use in real-life. Classes that don't have real-life application hardly ever motivate students to engage in meaningful learning. 3) Students use personalized technology to produce. Students learn by doing. So technology, especially mobile phones and tablets which are easier to handle and use than computers can really boost engagement and motivation. If you want your students to create, one of the cheapest and engaging ways is using the resources available on the Internet (Richard 2017).

One of the ways to implement the use of the true learner-centeredness can be done through using online resourses, namely, massive open online courses (MOOCs) in and outside the classroom. We looked into the methodological potential of the MOOCs offered by the FutureLearn platform and the Coursera's portal: "Geohealth: Improving Public Health through Geographic Information", "Introduction to Waters", "Introduction to Sustainability, Water, Civilization, and Nature: Addressing Water Challenges of the 21st Century" and others. These MOOCs are strongly oriented towards video presentation, participation and collaboration. The use of such free resources undoubtedly gives certain advantages for lecturers and their students, as it provides great opportunities to searching and selecting the materials that are best suited for educational purposes.

We implemented this project by offering the students the above-mentioned topics for self study and partly through doing it in a computer class. For monitoring the students' work they were asked to send the screen shots of their comments for further analysis and discussion in class. Upon the completion of a certain topic the students were given several questions for feedback to reflect on the course.

Methodology

Massive Open Online Courses (MOOCs) burst upon the higher education scene in 2008 and since then there has been ongoing heated discussion about their place in and effect on higher education. We propose to approach MOOCs, not as a replacement of traditional in-class instruction, but rather to selectively integrate those courses which are in line with the academic courses of home institutions which are not organisers of any MOOCs.

The term MOOC stands for Massive Open Online Course. Massive refers to scale giving opportunity for connections among participants, Open doesn't mean just free but refers to open access, open syllabi and self-directed learning outcomes, Online points to making materials available on internet in abundance, and Course referring to structure of the online course.

A MOOC consists of short lecture videos, learning tasks for individual or group work, quizzes, peer-graded assignments, discussion forums. The first Massive Open Online Course (MOOC) was conducted by George Siemens and Stephen Downes in 2008. MOOCs are characterized by the absence of formal requirements for enrolment and free participation, by the content being delivered entirely online in an asynchronous manner, by not requiring a link with universities and the lack of penalty for evasion.

By definition, MOOCs are offered in virtual environments, with online registration and use of videos, blogs, etc. and may or may not be linked to universities. The "M" refers to "Massive", which means that thousands of people can simultaneously take courses

(Clair - et al. 2015). This is the characteristic that differentiates MOOCs from other e-learning experiences, since it relates to the capacity and size of the network to generate new knowledge, thus reflecting participatory learning, respecting the diversity of the large number of participants (Knox 2014). The first "O" refers to "open", which means that participation in courses is not restricted by geographical location, age or financial resources. This aspect may include open technology, open software, open content, open evaluation process, open registration, and open educational resources (Kennedy 2014). The second "O" means "online," meaning that MOOCs are exclusively Internet-based courses. Finally, "C" refers to "Courses".

MOOCs contain open learning materials for online use. However, this information can be used for classroom teaching. In general, MOOCs: open up a large number of opportunities for life-long learning; are an effective tool for competitive recovery on the international level; offer an opportunity to enroll in courses offered by prestigious universities; cover a broad range of study areas (humanities, physics and mathematics, natural science, social sciences, etc); computerize educational process; present authentic video, audio or text information; are in English (some courses support multi-language subtitles); use a variety of interactive learning tools (online group discussion, online laboratory, online tests, etc); provide free or low cost education; have different durations of training (the courses vary from several weeks to a year) (Korolev and Pavolotsky 2012).

One of the biggest advantages of a MOOC is personalised learning which means putting the student in the center of education. It involves extending the educational concepts of differentiation (teaching tailored to the learning preferences of different learners) and individualisation (teaching paced to the learning needs of different learners) to connect to the learner's interest and experiences and meet the needs, abilities and interests of every student through tailoring curriculum and learning activities to the individual. The ultimate aim of a personalised learning environment is to create an educational system that responds directly to the diverse needs of individuals rather than imposing a 'one size fits all' model on students (Bates 2014).

MOOCs can be considered by some ESP teachers as online ESP language courses and EAP courses since they teach not only the subject area, but also English. It is important that a foreign language MOOC also includes the four major benefits of online language learning for learners: (a) flexibility, (b) personalization, (c) autonomy, and (d) automation (Blake and Guillen 2014).

Flexibility is a key characteristics of a MOOC because students can choose their level of participation in an "a la carte" manner without fees and any prerequisites other than internet access and interest, no predefined expectations for participation including no formal accreditation" (Cooper and Sahami 2013). An opportunity to select a course makes it truly learner-centered.

Integrating MOOCS in the English language classroom for the Science Students

We can integrate a MOOC in the English langaguage classroom in several ways. We will demonstrate this using the online platform Futurelearn as an example.

First, this resource is good for both individual and group work and can be considered learner- centered since it focuses on the students' professional interests.

It offers a great variety of courses for geoscience students to suit different tastes and interests. In the category "Nature and Environment" students have a choice to select from a variety of topics: Concepts in Sustainable Development: An Introduction to the Key Issues, Environmental Challenges: Human Impact in the Natural Environment, Environmental Challenges: Scarcity and Conflict in the Natural Environment, The Earth in My Pocket: an Introduction to Geology and several others.

The last course prepared by Open University offers an introduction to geological processes and invites the students to make a journey of discovery, digging out the geology of the world around us and to find out some amazing things about the Earth. The students

learn about different types of rock, before finding and identifying some rocks near them, at the rock cycle and plate tectonics, the link between volcanoes and your mobile phone, or why tiny marine wildlife is at the core of the plastics industry. The students can explore basic geological processes, focusing on how, where and why different rocks and natural resources form across the Earth. Also, they look at some of the environmental and sustainability considerations that geologists need to take into account when extracting and processing these resources.

The course consists of 4 weeks, students are invited to spend three hours a week to complete it.

Since our students have different levels of proficiency in English, they have an opportunity to do the course in their own pace which is a tremendous advantage. One of the benefits is that the students are not forced to complete the whole course if they feel unable to do it. We encourage them to do as much as possible taking into account their individual abilities and competencies.

By doing this we maintain their motivation to learn both their subject and professional English.

This course is conducted by Anne Jay, a lecturer in the School of Environment, Earth and Ecosystem Sciences at the Open University. She researches the geologic structures called large igneous provinces. The second instructor is professor Marcus Badger, a lecturer in Earth Sciences at the Open University. His scientific interests include organic molecules preserved in rocks to study the past 66 million years of the Earth's carbon cycle and climate.

Since the developers of such courses are specialists in their field, the students trust the information provided by the course to develop their specialism knowledge.

Findings and results

In a broader sense, such MOOCs can be considered as "live" textbooks both for the students and professors.

MOOCS could also be successfully done in groups in the form of a flipped classroom where "the extra class hours could be utilised positively for more interaction and in depth discussion of relevant topics." (Fagen 2012). This implies that teachers should participate in the 'flipped classroom' approach as learners so that they genuinely facilitate enriched learning in the classroom.

Moreover, we strongly believe that MOOCs can be collaboratevily developed by an interdisciplinary team of Russian educators from the geosciences and ESP teachers and educators, on the one hand, and a partner university colleagues who can develop a comprehensive comparative analysis of real world issues and practices, on the other hand. We suggest that such online courses will be beneficial for all the participants involved.

One more important distinction of MOOCs from regular courses is the opportunity for students to collectively discuss its topic on an online forum under the teacher's supervision. This could be the major advantage for geoscience students of Perm State University as well as most Russian institutions of higher education, since they do not usually have seminars on the geological and related subjects and thus tend to adopt available geological information 'as is', without proper critical re-evaluation. In other words, online forums of MOOCs can add an important component to the educational process allowing students to develop strong professional thinking and gain deeper understanding of the subjects. Additionally, the fact that geoscientific related MOOCs are held in the English language can possibly increase the level of engagement of students into the discussion. Discussions are arranged once a week in a traditional classroom to monitor the students' performance where they report on what they have read about and what new things they have learned and as a means of developing the learners' speaking skills. The teacher can also prepare a number of questions to ask the students to assess the knowledge they have gained. Upon the completion of a course we organize a roundtable discussion that covers the major topics of the MOOC.

Another form of the speaking skills development is organizing a conference where students make presentations on the analysis of the information learned. Traditionally, we invite specialists-experts to participate in the conference.

One of the ways of assessing the students' progress in the English language skills for specific purposes is the learners' feedback analysis where they are offered the answer some questions about what they particularly liked in the course, what they did not like, what difficulties they faced, what language skills they were able to improve, what they learned about the subject area and whether they would like to study new courses. They were instructed to give full answers to the questions.

The results of the feedback analysis show that their reading, writing and listening skills have considerably improved and special vocabulary has been expanded. Overall, the students' feedback was positive.

Conclusions

These modern models of e-learning seem to be promising. They are freely distributed, user-friendly and utilize the existing approaches to the topics and problems studied. These resources, however, should be a part of a blended course whereby both conventional and innovative methods are combined. It is explained by a limited number of hours taught, the curriculum and the Russian state educational standards.

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