

## USE OF OPEN EDUCATIONAL RESOURCES IN TEACHING PROCESS AT FACULTY OF ARCHITECTURE, CIVIL ENGINEERING AND GEODESY AT UNIVERSITY OF BANJA LUKA – SURVEY

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**Abstract:** In this paper, the use and impact of Open Educational Resources (OER) on the teaching process at the Department for Mechanics and Structural Analysis, at the Faculty of Architecture, Civil Engineering and Geodesy is analysed. The initiative came from the first author who started an educational blog *budi.inzenjer.org*, where short Youtube tutorials were posted, explaining various concepts taught in the courses. The teaching staff supported the initiative by active partaking in the creation of materials, and their use in the teaching process. After using OER for more than four years, a survey was conducted among students to study the impact of materials. Another goal was to assess the purposefulness of further development of the materials and interest for their integration into complete Massive Open Online Courses (MOOCs), designed according to the needs of the target group. The results of the survey are analysed in the paper.

**Keywords:** OER, educational blog, MOOC, impact survey

### 1. INTRODUCTION

The current model of the education system, based on several centuries old Prussian model of compulsory education does not correspond to the current level of development of technology, economy and society.

This phenomenon is best described in a speech delivered by Salman Khan, [1], (the founder of Khan Academy), describing the transformation of the educational pyramid and expertise of workers during the periods of different

levels of development of economy and technology. Prussian education model, which is largely present even today, responded to the economy that required extensive workforce and only a small number of highly educated skilled personnel. With the development of technology and society, the demands of the economy have changed (an increased demand for highly educated staff, and reduced demand for regular workforce). At the same time, the education system has remained largely unchanged, and is unable to respond to the needs of the new age.

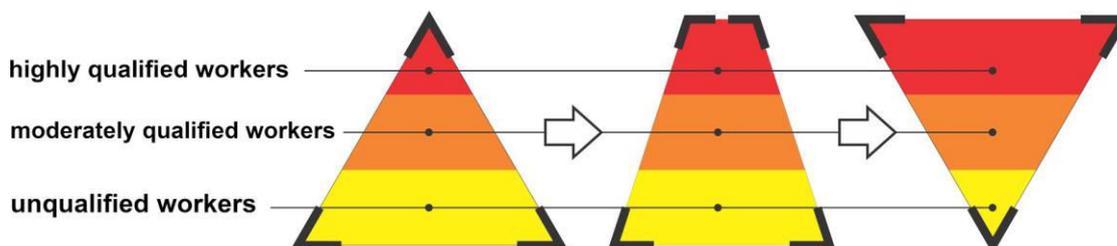


Image 1: Worker qualification pyramid over time

### Open Educational Resources (OER)

Open educational resources are teaching, learning and research materials in any medium available in the public domain or released under an open license that permits

access, use, adaptation and redistribution by others with no or limited restrictions, [2].

Open licenses have resulted from an effort to protect authors' rights in environments where content (particularly when digitized) can easily be copied and shared without permission. The aim of open licenses is to ensure that copying and sharing happen within a structured legal framework that is more flexible than the automatic all-rights-reserved status of copyright. They allow permissions to be given accurately, while releasing the restrictions of traditional copyright. OER are part of this process. They provide more flexibility in the use, reuse and adaptation of materials for learning in local contexts, while allowing authors to have their work acknowledged.

Some advocates of OER say that a key benefit of open content is that it is 'free', but this is simplistic approach. Open content can be shared with others without asking permission from the author and without paying license or other access fees.

Massive Open Online Course (MOOC) will be addressed in this paper as a special form of OER. MOOC is an online educational course aimed at unlimited participation and open access via the web. The upgrade to traditional courses, MOOCs provide significant participant interaction in the teaching process through user forums. Although not all of today's MOOCs can be categorized as OER, in this paper, they are certainly meant as such.

## **2. THE EMERGENCE AND USE OF OER AT THE FACULTY OF ARCHITECTURE, CIVIL ENGINEERING AND GEODESY**

The emergence of OER and MOOCs can be regarded as a turning point in today's system of education, which will in near future, by all indicators, have a tremendous impact on whole of mankind. At some point in future, it is not hard to imagine the possibility for worldwide students to obtain an affordable and widely recognized degree at some of the most prestigious universities through online learning, which could lead to a drastic decrease of the number of enrolled students on local universities. In that case, educational institutions will have to adapt to the new education model if they wish to keep their relevance and competitiveness.

Looking up to Khan Academy [3], and with a goal to provide students with free and permanently available educational content, a website "Budi inženjer (ako si faca)" [4] was created. It is an educational blog where various video tutorials in different areas of Civil Engineering can be found. The goal of the tutorials is to present certain concepts and principles that are used in practical problem solving in a simplified manner, as well as to encourage lifelong learning. The page was founded in 2011 by the first author of this paper who was a student at FACEG at that time. Significant support came from teaching staff at Department for Mechanics and Structural Analysis. Today, the page generates solid traffic with users from all over the ex-Yugoslavia, due to language

similarities. It was later decided to publish the materials as OER.

As a result of this initiative, new OER materials, which will later form the MOOCs, are being developed. Within this, as of 2014, University of Banja Luka is participating in the realization of Tempus project BAEKTEL (Blending Academic and Entrepreneurial Knowledge in Technology Enhanced Learning) [5], whose one of the main goals is creating and publishing OER in cooperation with partners from industry.

With this in mind, after using OER for more than four years, a survey has been conducted among students at the Faculty of Architecture, Civil Engineering and Geodesy (FACEG) in Banja Luka, at the Department for Mechanics and Structural Analysis. The main goal was to study the impact of these materials on the teaching process. Another goal was to assess the purposefulness of further development of new materials and interest for their integration into complete MOOCs, designed according to the needs of the target group. The results of the survey are analysed in the paper.

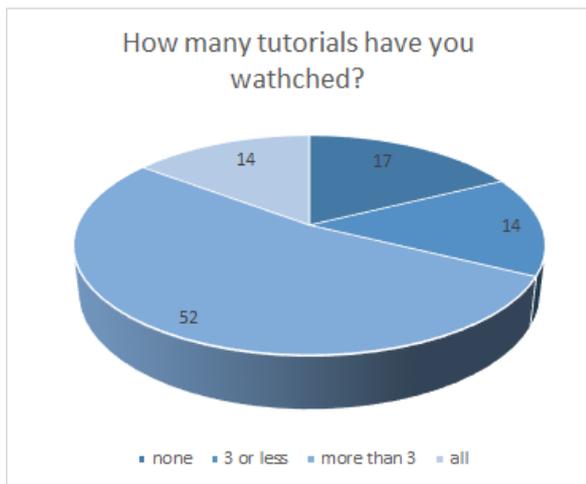
## **3. ANALYSIS OF SURVEY RESULTS**

After four years of using the above mentioned OER, an anonymous survey has been conducted among the students of FFACEG, about their experience with OER and the use thereof. One of the goals of the survey was to establish the purposefulness of producing OER and confirm the justification for their further creation and the formation of MOOCs in the future. A short review of the survey is given below, together with a brief analysis of the results.

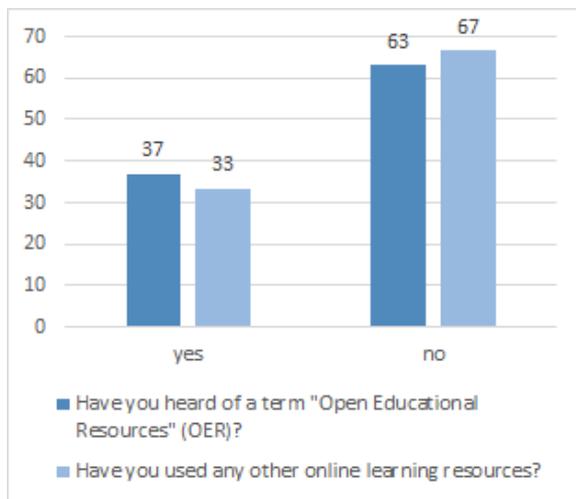
### **Survey validity and representativity**

A total of 138 students enrolled in the first cycle of studies at FFACEG took part in the survey, which is approximately one third of the overall number of students that took one of the courses covered in tutorials.

Even though, based on the results of the survey, approximately 85% of the students have used the website *budi.inzenjer.org*, Image 2, only 63% actually heard about the term "OER", Image 3. One third of the examinees used materials other than on the website *budi.inzenjer.org*.



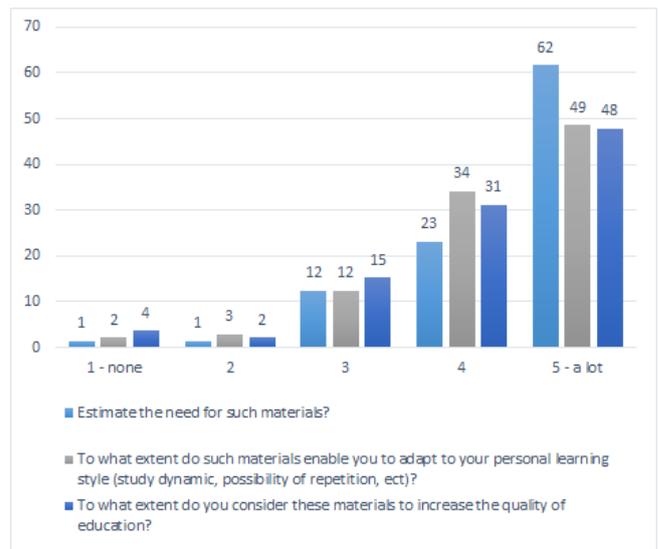
**Image 2:** Number of watched tutorials



**Image 3:** Familiarity with OER and other resources

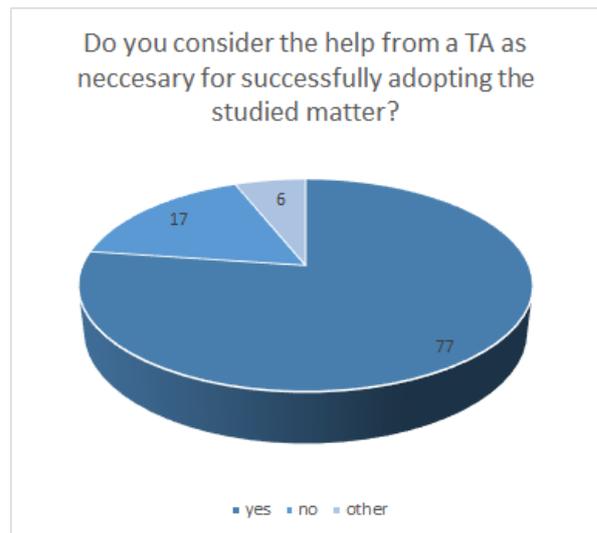
### Justification for OER and their purposefulness

The survey confirms the assumption that online educational resources enable the students to better adapt to their own learning style and pace, as about 83% answered affirmatively, 5% negatively, leaving 12% indifferent. Accordingly, 85% of students sees the need for such materials, and finally, 79% agree that these materials increase the quality of education, as can be seen on the Image 4.



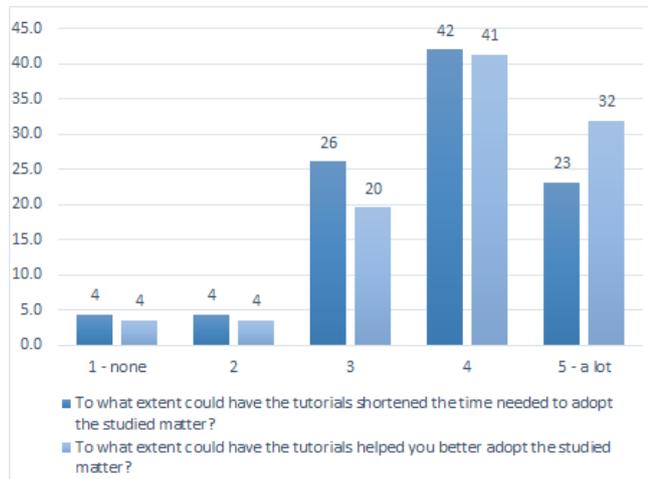
**Image 4:** OER impact on quality of education

Even though a great majority of students found the materials extremely useful, 77% of them still thinks that OER cannot replace the role of the Teaching Assistants (TA) in the teaching process, Image 5. 6% stated it depends on other factors, such as the complexity of the matter.



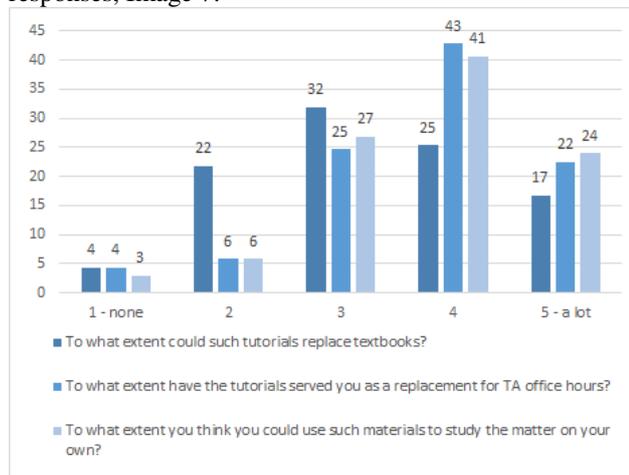
**Image 5:** Opinions on importance of Teaching Assistants supervision

The majority of students agree that the tutorials, not only shortened the time needed for learning a certain matter (65%), but also had helped them better understand it (73%), which confirms the previous result on the contribution to increase in the quality of education, Image 6.



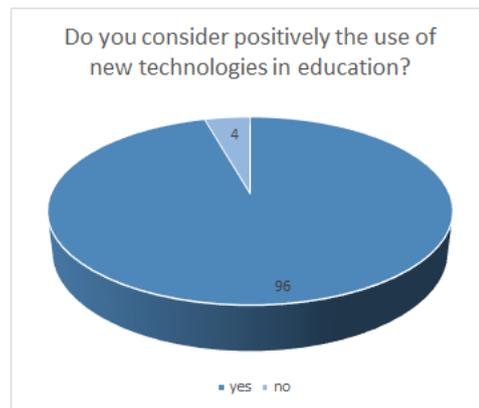
**Image 6:** Impact of tutorials on quality of learning

Identical percentage of students (65%) both consider the materials as a replacement for office hours, as well as help them learn on their own. On the other hand, their opinion about the possibility of such materials replacing textbooks remains divided, without clear distribution of responses, Image 7.



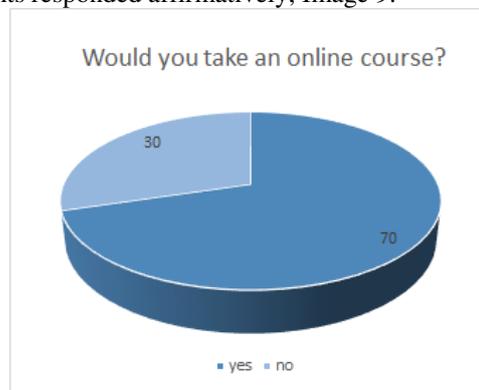
**Image 7:** Impact on traditional methods

Great majority of students (96%) perceive as positive the use of modern technologies in education, Image 8.



**Image 8:** Opinions on usage of new technologies in education

Finally, asked if they would take an online course, 70% of students responded affirmatively, Image 9.



**Image 9:** Opinions on potential participation in online course

Students were also asked to share their experiences, offer suggestions and give feedback about the materials. A number of very interesting comments were received, here are a couple of them:

*“We often lack concentration in class, and as a result, we miss some key information and methodology regarding problem solving. When that happens, we cannot turn back time, like with the online tutorials. I would like to commend everyone involved in making these tutorials on the website [budi.inzenjer.org](http://budi.inzenjer.org). I wish there were more such materials for other subjects that we study at the faculty.”*

*“Tutorials on [budi.inzenjer.org](http://budi.inzenjer.org) are pretty good, the explanations are great and the tutors are very good. The quality could probably be increased by doing more different examples for a certain subject, and by expanding the subjects covered in tutorials. Of course, this takes time, but it could be done. I hope there will be many more tutorials with time, as this method of learning is suitable for everyone. You can watch the tutorial as many times as you want, without fearing about losing focus or missing something important.”*

Based on the overall positive results, the survey can be considered as a confirmation of justification and purposefulness of OER and serve as a support and wind in the back for the teaching staff to continue their efforts in the creation of MOOCs.

#### 4. CONCLUSION

Based on the results of the survey, a conclusion can be made that, while online tutorials are indeed a required and useful supplement, they are not a replacement to the existing educational materials and teaching methods. The goal of online tutorials was rather to increase the quality of education, than to diminish the role of TAs, i.e. teachers in the process of learning. The possible decrease in need of office hours and live lectures could actually free up time for creative work, where a more personal contact is needed. On the other hand, tutorials could clear some of the most common dilemmas and uncertainties students have, due to either holes in their pre required knowledge or lack of concentration in the class.

From the perspective of the teacher, OER offers opportunities that we yet have to realize. Although the role of the teacher will remain significant, it becomes necessary to change the standard approach. Due to increasing amount of high-quality OER, teacher who is not improving every day can easily be surpassed by talented students.

Modern devices brought encyclopaedia knowledge at our fingertips. Learning facts and information becomes less and less meaningful. Ability to understand and relate basic concepts along with out-of-the box approaches to problems are the real knowledge, now more than ever. Consequently, educational institutions will have to make some substantial changes in order to fulfil expectations of students and labor market.

During these years, impact of OER was obvious. Many students adopted video tutorials as additional learning resources, which helped them during their studies. They did not have to come for office hours and even when they came, questions would be much more complex than usually. On the other hand, it was clear that, for some students, published OER was out of reach due to poor basic knowledge which lead to further confusion and loss of time. For these students, more basic tutorials are needed along with clearly stated prerequisites.

Finally, considering only students were included in the survey, it remains unclear what are the current views of the teaching staff regarding OER, and leaves space for conducting a similar survey among them as well.

#### LITERATURE

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