A MOODLE BASED MOOC LEARNING ENVIRONMENT IN MAKING COLLEGE EDUCATION GREENER

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Abstract
While e-learning and MOOC enrollments in higher education show significant growth worldwide, in Hungary the mostly EU financed e-learning trials are just still isolated experiments that spread slowly. The rising living cost and the shrinking budgets cause educational institutions to rethink the method that traditional education is delivered. More and more attention is focused on how students' financial contribution can be reduced. This study introduces an e-learning (MOOC) application that has the potential to reduce students' costs compared to the traditional was of teaching while producing the same educational result by offering online material that can be acquired by autodidact way. The experiment is utilized in a one-semester long program in teaching Statistics offered by Karoly Robert College (KRF) for non-full time students. The KRF's e-learning program consists of paradigms: MOOC-like courses, course redesigns (series of videos, series of interactive lessons, self-evaluating tests, cross-evaluated tests, exercises, exercises with detailed solution).

Keywords: MOOC, Moodle, course redesign, green education
Jel Code: I23, I25

Introduction

While governmental policy makers worldwide are strongly confronted with the amount of money invested into higher education (Tilak, 2006); the Hungarian government is unambiguously determined to decrease the investment in higher education. The real cost cutting was acted in 2012, when the total public expenditure on higher education was one-third less than it was a year before; and since 2013 it has been declining. Hungarian higher education has been in difficult situation since global recession period as governments reduced financial subsidy and causing uncertainty among future college students and whirling certain institutions into financial doom. As if the threat of unemployment was not enough, the lack of financial subsidy also determines the quality of education, which is a milestone in labour market (Csehné Papp - Hajós, 2014). In addition, under these hard circumstances students are encouraged to invest into higher education by applying student loan. Student loan is a dangerous, long-run weapon. It is easy to sign the contract now but its pulled trigger affects decades later. In Hungary, student loan has no history but it is worth considering countries where it has. In the United States, the aggregate total of unpaid student loan debt has passed $1 trillion, more than the total of U.S. credit card debt (Mak, 2011) furthermore, the average graduating student possess a loan debt around $24,000, including a continuous increase of 3-5 percent since then reaching higher amount than $30,000 by 2014 (Fairchild, 2011). Do we really want to encourage our future generation to follow this path? Student loan cannot be a general solution because of its unpredictable future.
As higher governmental grants cannot be expected from Hungarian government to solve this problem, the solution must be sought in lowering the college costs. E-learning is name of the technology that serves as a respond to it.

While in the 2000s e-learning was considered a useful cluster of technological interventions but was never regarded as a core strategy in forming higher education, in 2010s it became a critical element in institution strategy at most American colleges and universities (Sloan foundation). In the first Babson report (2004) 57 percent of the academic leaders responded that learning outcomes of online (e-learning) education are equal to or superior to face-to face. In the most recent report it is 77 percent (Allen Seaman, 2014).

The aim of the paper is to provide basic information on relatively new educational phenomena called Moodle and MOOC and to introduce a recently created MOOC in Statistics at KRF.

The first paradigm: MOODLE and MOOCs

The first version of Moodle (Modular Object-Oriented Dynamic Learning Environment) was released in 2002, while the first MOOC (Massive Open Online Course) almost a decade later, only in the fall 2011. Both became ultimate success, the latter involved 300,000 enrollments for the first six online courses from all parts of the world. These 2 acronyms have changed the notion of education once and for all. Moodle provides a complex set of educational tools for individual course planning, while the notion of MOOC gave the idea of providing a series of video-lectures followed by small-group discussions and mid-term and end-term papers, usually tests or essays. After registration the MOOC participants follow the outline of the chosen course schedule by providing nexus for active communication and collaborative workshop. Some students use the technologies of social networking such as Twitter. The most significant MOOC providers are Stanford's free Massively Open Online Course and the Harvard-MIT called Ed X. The values of MOOCs are:

- they aim to reach very wide audiences – only wideband Internet connection is needed
- they both use an open-source model dedicated exclusively to web-based delivery (MOODLE)
- they (mostly) offer courses with free of charge

MOOCs integrates the connectivity of social networking, the facilitation of a distinguished professor in a field of study, the melting pot of self-motivated students with different multicultural background, and a wide range of resource material collection. MOOCs usually are free of charge; there are no prerequisites other than wideband Internet access and motivation. The major strength of MOOCs is that the multicultural heterogenic participants bring to it in terms their knowledge, experience, skills, personalities for successful communication among them. If the digital society of the 21st century is able to settle down to communicate it may even bring new hopes in other problem-covered areas of the world issues. In digital economy, capital lies in the capacity to leverage, connect and promote knowledge (Lesser, 2000).

The second paradigm: course structure redesign

In the traditional way of education the instructor's role is like sage on the stage; the professor talks and the audience listens. There are several educational methods to maintain students' attention but it has been shown that approximately 12 minutes is the maximum period of time within which an individual's attention can be fully captured

(Kasteler, 2015). What is the students' learning process like after the 12th minute in 90-minute-long lecture? It takes at least a magician to maintain students' attention for such a long period in case of a one-direction communication. Creating small learning groups to establish learners' dialogue and to keep attention alive is not the solution either. It is not enough to introduce some tools to create an effective working environment; one should also design for the building of connections, collaborations between resources and people. In a learning environment characterized by change, the tools and applications it recommends to learners and the connections it facilitates to other learners and knowledgeable others are vitally important to create learning experiences (Fournier, 2011). The learning flow might be visualized as done by Kop (2010) in relation to a personal learning environment and shown in Figure 1.

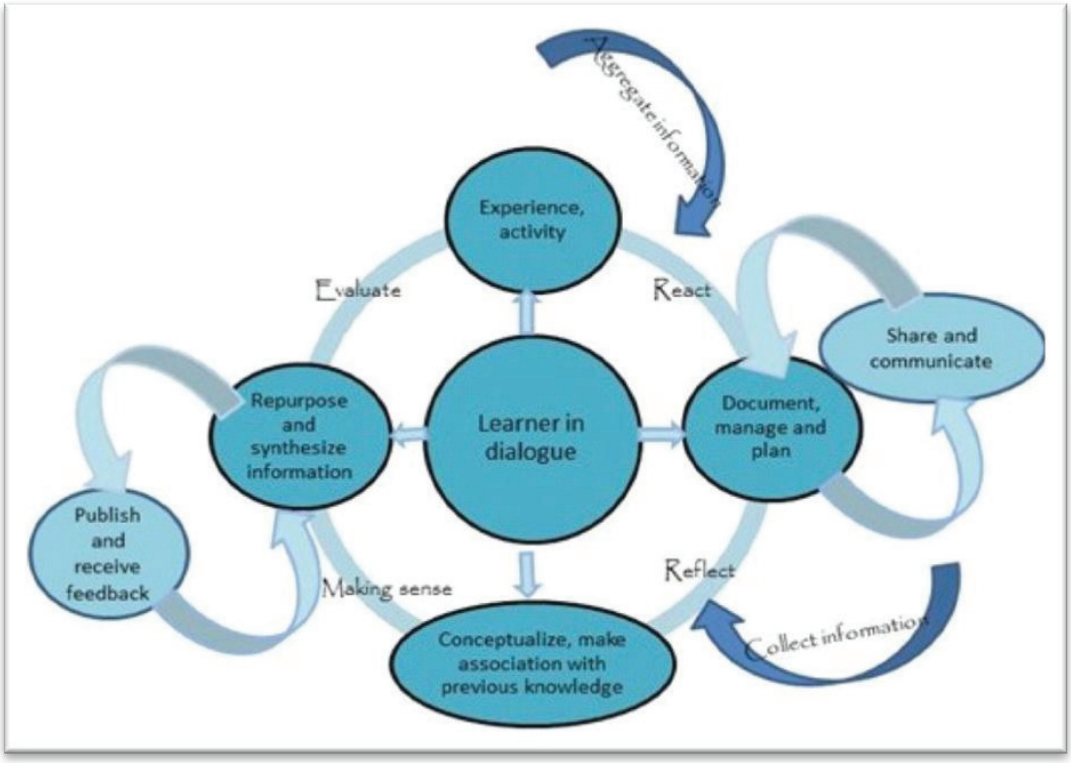

Figure I Model of learning on an open network learning environment (KOP, 2011)

An e-learning course can only be effective if the learner's need is in focus and if the learning process is placed in a learning environment that satisfies the following principles:

- active course management and perky multimedia elements: enthusiastic instructor is a minimum requirement. All non-text based learning materials must reflect interactivity.
- active student-instructor and students-students contact: communication is regarded one of the basic means of any contacts, active student participation can be maintained by involvement. A good lecturer must know the possible stand-offs of the course and does not let students lose interest.
- difference between individual and team-work among students: crystal clear instructions must be given from the very first moment of the course on what is thought be solved alone

- active learning requirements material: reading, comprehension check, conditional progress. Learning is by doing and understanding is by learning.
- prompt instructor and students feedback: a test result is never enough. Students are strongly encouraged to "speak out" their thoughts based on they had acquired.
- deadlines on tasks: students' progress requires regular assignment activities. Students must be informed in time and several times on future deadlines.
- continuous and random encouragement: student dropout rates are dramatic in MOOCs. Social factors affect dropout significantly (Yang, 2014), an effective course involves jaunty media elements regularly to increase student motivation.

MOOC – Course structure

A MOOC was created on a KRF's server (muk.karolyrobert.hu) with considering the previously listed course design criteria (Figure 2).

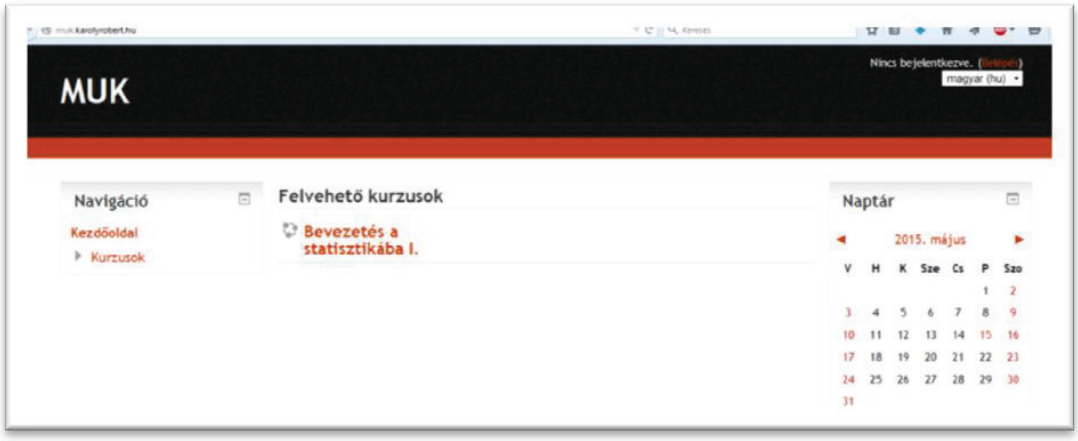

Figure 2 The website of muk.karolyrobert.hu (own construction)

The **Statistics** course (in Hungarian) is a compulsory, 2nd semester course in Economic Informatics training. The course credit value is 6 and previous student performances show a higher-than-average dropouts or course performance failure compared to other courses.
The MOOC statistics course is planned for 6 weeks. Its aim is to provide an alternative way of education where the registered students can make a step-by-step progress in acquiring the relevant teaching material. The course is divided into 6 units, each consists the same construction design.
Course elements: video lessons, interactive lessons, tests for self-evaluation, cross-checked tests, exercises, exercises with video solutions
Video lessons: all videos are recorded in the KRF's bluebox videostudio and edited with Adobe Premier Pro program. The maximum length of the videos is less than 5 minutes to achieve higher students' willingness to watch them till end. The videos are uploaded into a college server and Youtube (unlisted), too. The teaching material is at our students' disposal; students can watch them as many times as needed (Figure 3).

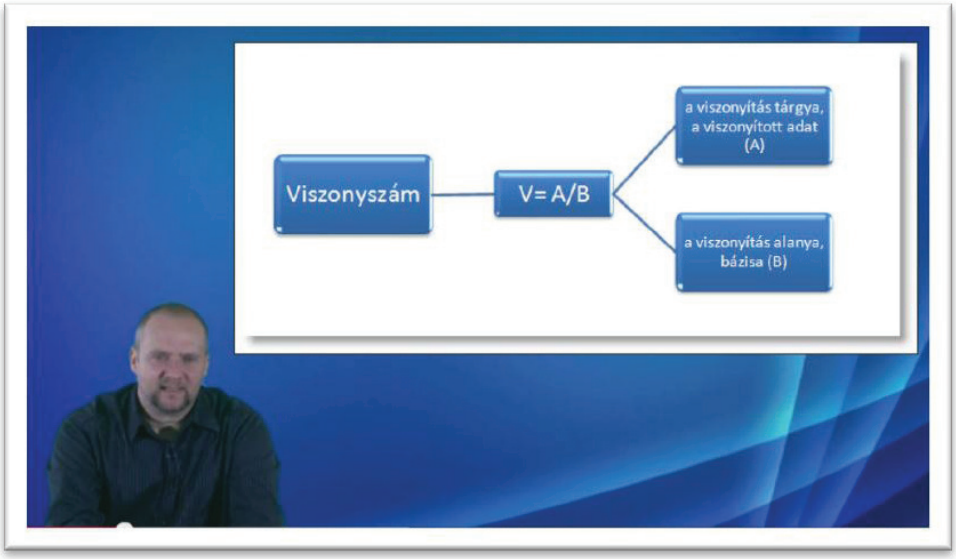

Figure 3 A screenshot of a video lesson (own construction)

Interactive lessons: each teaching material is divided into units with taking into consideration the "one idea – one slide" concept, thus generating a great number of picture slides. After every third slide (in average) a conception/comprehension check slide appears and students may only continue their progress if good answer is provided. In case of wrong answer students are redirected to the relevant lesson slide to seek for the correct answer. Answers provided by the students are scored (right answer: 1; wrong answer: -0.1) thus at the end of each lesson a score is given to the student performance (Figure 4).

Figure 4 A screenshot of an interactive lesson slide (own construction)

Tests for (self-)evaluation: at the end of each unit mock (for preparation) and real tests are completed by the students. Feedback about performance and self-assessment are important parts of a learning environment. There are several ways to give feedback to students: on each question or overall. The quiz module can display feedback and scores

at different times during the quiz, using the review options in the settings. The next unit is available in case of producing satisfactory result in the former one (Figure 5).

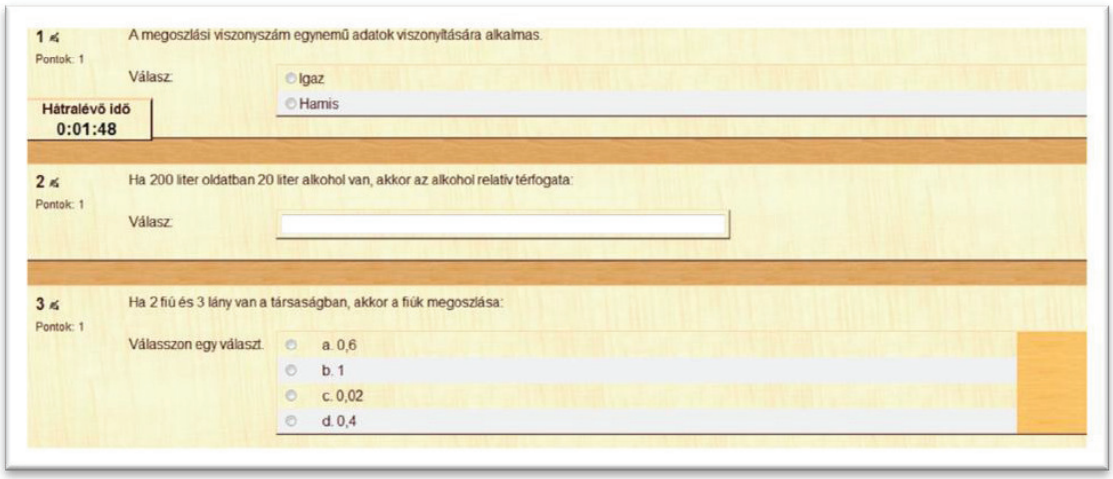

Figure 5 A screenshot of a test (own construction)

Exercises (.xls) with video solutions:
The theoretical knowledge is put into practice by providing exercises in Excel. Each exercise includes a forum that gives possibility to students to share their comments or ask questions. Each exercise is followed by a tutorial video that includes the detailed solution. The explanatory videos are made with Camtasia screen recorder (Figure 6). Every single step of the solutions is sensibly explained in order to achieve deep understanding.

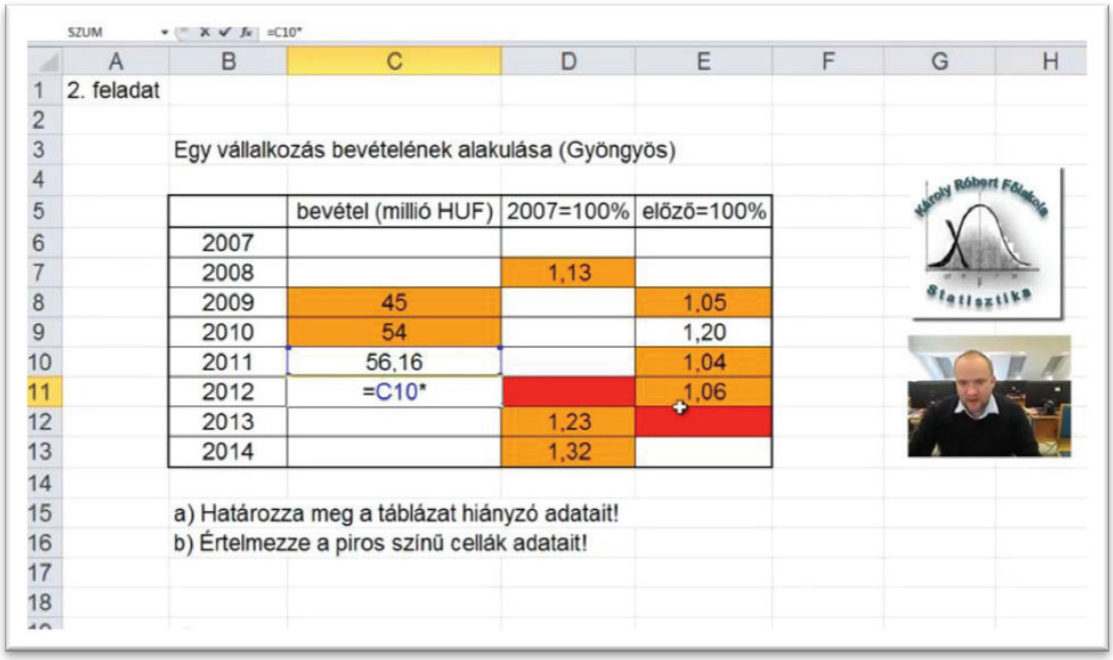

Figure 6 A screenshot (own construction)

Conclusion

The Statistics MOOC course was launched in spring semester, academic year 2014-15. The course was open to the students of KRF with only one registration condition; each KRF student had to invite a non-college person. The idea behind this notion is that two student groups are to be analysed by the indicators of course attendance and performance. When submitting this paper the course is at half-time and the instructor's highest expectations are surpassed by the students' achievements.
MOOCs are in essence a restatement of online learning environments that have been in use for less than a decade. The possible success of the Statistics MOOC course at KRF expects to give birth to other MOOC courses. The pedagogy behind this new form of education – compared to the traditional education - is that students are expected to acquire the material by keywords of connectivism and connective knowledge. Students learn by cooperating and sharing. The primary aim of creating the Statistics MOOC course was to change the students' perception from the "passive listener" to the "active agent" position. Although some moderations and changes must be necessary to achieve the notion of effective learning material. MOOCs present an opportunity to conduct educational research and examine the potential for use of its elements in on campus settings as a form of flipped classroom or blended learning approach. The nature of higher education will have changed as a result of this phenomenon.

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