Mooc vs. traditional learning –possibilities and weaknesses of e-learning sites

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Abstract - As a member of a research team at the University of Szeged, we have started to develop a new e-learning platform for teachers and students of the next generation. As a first step, a literature review helped us collect good examples and studies in order to prepare a summary and to define "how an e-learning platform looks like today". It has been well established that software and hardware make up just one part of the e-learning environment; therefore we had to identify methodological possibilities and weaknesses among cases of traditional and electronic learning out of which we developed a plan for our new platform.

This paper aims at presenting my research in the field of E-learning and distance learning, with the topic: methodical possibilities and weaknesses of e-learning sites. Firstly, in my analysis, I intend to show those main components which are necessary for good e-learning sites, from the students' and the teachers' point of view. Our platform will contain an automatic logging service, which could be of great help to teachers. Secondly and most importantly, I have made a collection of potential measurement objects which can help us to generate automatic reports of validity for teachers.

I. INTRODUCTION

Nowadays, the way we approach communication, industry, and learning has considerably changed and developed. For example, a few years ago video games were all played offline, but by today most of them have been transformed into online applications. Furthermore, we have to mention e-mail services as well, which have become the primary communication tools for universities, but according to some studies they come with a considerable and recent novelty showing that students avoid using emails putting Facebook and Viber forward [6][11]. If we take a look into relevant research and publications, we have to realize that our education system has to find alternative ways to distribute knowledge for the next generation to include "up-to-date" services for students and teachers [10]. It is necessary since the access to the Internet and broadband connections have increased rapidly and a huge growth in mobile connectivity has brought online content and interaction to the global audience. At the same time, open online distance learning in higher education has quickly gained popularity, expanding and evolving at the same time. Recently, according to [21], Massive Open Online Courses (MOOCs) have appeared to be a significant force within higher education, while within the current educational landscape Massively Open Online Courses (MOOCs) have stimulated extensive interest and hype in a short time [18]. As a result, education has never had such intense social effects before. Lately, the most prestigious universities worldwide have been publishing academic resources in open environments resulting in generating hundreds of thousands of users of online platforms, and a similar number of enrolments each academic year [2]. The popularity of Massive Open Online Courses (henceforth MOOCs) is gradually expanding, and the perceived educational add-value of their scalability to the masses is growing [16].

Massive open online courses (MOOCs), a synonym for a recent modality of distance learning wherein course materials are made available online and are freely accessible to anyone with a computer access, have been rapidly gaining popularity as new platforms and courses online [22]. However, while new web technologies (MOOCs) allow for scalable ways to deliver video lecture content, to implement social forums, and to track student progress, we remain limited in our ability to evaluate and give feedback for complex and often open-ended student assignments [21].

II. ABOUT MOOC

Why are MOOC courses so popular? One apparent response to this new trend is real financial investment: text book publishers are rapidly re-inventing themselves as purveyors of on-line education and are lobbying the government for an equal slice of pie against universities; in the meantime, venture capitalists are lining up at universities' doors trying to buy themselves a share of more popular courses [18]. But what is MOOC in fact? Massive Open Online Courses (MOOCs) are digital (academic) teaching formats which offer stimuli for developing the concepts of e-learning, Web 2.0 and open educational resources [9]. These academic courses are available worldwide to the general public; there are no preconditions; and they are usually free of charge [13][8][3][4][19]. A typical MOOC of 2014 could have taken place over 4 to 10 weeks and video lectures were the primary

and an extremely crucial part when MOOC instructions were designed [20]. Students, on average, dedicate two to six hours a week to a course [21]. MOOCs offer an immense amount of innovative potentials in a wide geographic range having the capacity of reaching a good deal of participants; furthermore, they offer the use of collaborative formats and transparent teaching methods [9].

The field of open and distributed learning has experienced a surge of media coverage and public interest in the last several years, largely focusing on the phenomenon of massive open online courses (MOOCs). The term MOOC has been used to describe a diverse set of approaches and rationales for offering large-scale online learning experiences. MOOCs have been delivered using both centralized platforms and services including learning management systems (LMSs) and decentralized networks based on aggregations of blog sites and social media feeds. MOOCs have been designed to support university curricula, academic scholarship, community outreach, professional development, and corporate training applications [1]. Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Do not use abbreviations in the title or heads unless they are unavoidable.

III. POSSIBILITIES AND WEAKNESSES

Higher education institutions are quickly coming to terms with e-learning making it a routine, which is a surprise [9]. MOOCs are, therefore, stimulating important transformations in higher education, especially by encouraging online teaching and learning in regular credit programs [7]. Apart from the "one size fits all" approach that MOOCs follow, they can be characterized by scaled up class sizes and the lack of face to face interaction coupled with such high student teacher ratios [20]. In this sense, some studies have been done in order to find out which aspects influence the apparent high drop-out rates to show if this one should raise concerns or not. This failure is attributed to academic subjects, the heterogeneity of participants, and the curiosity that is awoken in a learner who has no real intention to do the course [2].

On the other hand, modern technological solutions allow the collection of users' logs like clicking attitudes, video click stream interactions, etc. Whilst data provide several opportunities for quantitative analysis of users, their learning journeys and their use of learning resources, data analytics makes only a very small contribution to evaluate the success of a SOOC [12].

Modelling user experience in MOOCs supports research efforts to better understand user needs so that experiences that are more conducive to learning can be offered in the future [5]. Determining how learners use MOOCs effectively is critical to providing feedback to instructors, schools, and policy-makers on this highly scalable technology [22]. Measuring equipment is able to do this job but it is not yet fully developed and an urgent improvement would be highly appreciated.

We have to realize that the rapid growth of public and educational interest of MOOC will provide a real opportunity to collect massive data from users, which can in turn help us to increase the accessibility to knowledge and information resources to understand users' attitudes and needs. This will probably help us understand why MOOC generates so high drop-out rates.

IV. OPEN QUESTIONS AND POTENTIAL ANSWERS

The most explicit criticism against distance learning is the fact that it isolates communities, provides a poor platform for an in person communication between teachers and students. This has been underpinned by El-Hussein [14] who stated that we would be able to expand traditional classroom learning environments using smart devices with built in Internet accessibility, though new virtual obstacles and barriers may arise [14]. One of the challenges that Massive Open Online Courses (MOOCs) face is that they lack a physical medium that enables active real-time interaction between students and instructors, especially when compared to an offline learning environment. [17]. In a typical MOOC, between 5% and 10% of students actively participate in threaded discussion forums [5]. In another research conducted by Bergner [22], it was revealed that hundreds of students scored very high on the final exam of a course but spent almost no time learning; in other words, these students already knew the content, but took the tests for fun or for the certificate [22]. The opportunity of downloading a learning pack and its use in an offline learning environment seems viable, but cannot be treated as a real learning environment since it lacks its positive benefits.

To solve the problem of motivation, some studies investigated online forums and found connections between drop-out rates and students forum attitudes. They revealed that there are some students who accommodate themselves to this situation voluntarily helping others by answering questions in discussion forums. Student leaders encourage other students to participate in discussions to make online learning experience much more collaborative and engaging [17].

Further research topics could be self-motivation, circumstances and decisions that make somebody participate in a course, and the persistence to complete a course.

The basic types of motivation are enumerated by White et. al. [18]:

MOOCs are free and open,

MOOCs are convenient: fitting around life,

MOOCs enable learning with the best,

MOOCs professional development and lifelong learning,

MOOCs satisfying interest and usefulness.

Some researchers have found that extrinsic motivation can greatly influence the success of a course completion [23]. Schultz [9] found that course achievement can drop down to 10%, while in a study conducted by Námesztovszki et. al.[23] this number was much higher reaching 50%. Factors that may influence research data include additional points that can be added up to the exam results. A further opportunity is the use of MOOC blended learning, which can take advantage of the benefits of a traditional face-to-face and on-line education. A case study by Schultz [9] reveals that there are asynchronous teaching segments such as recordings and forums, as well as synchronous live sessions. Similarly to the concept of "blended Elearning", "blended MOOCs" have also emerged at which participants or groups are physically present as well [9].

There might be a solution in the form of an adaptive learning platform, though it is still a utopian idea because neither of the current systems are feasible for MOOC instructors to manually provide individualized attention that caters to different backgrounds, diverse skill levels, learning goals and preferences of students, there is an increasing need to make directed efforts towards automatically providing better personalized content in e-learning [20].

Meanwhile, institutions are making increasingly significant investments to produce MOOCs, and learners are enthusiastically enrolling in large numbers, often in tens of thousands. The analysis presented identifies a spectrum of motivating factors for universities, and suggests likely areas for future attention and developments. It further identifies a range of motivations of learner participation, which may not be identical across cultures and which MOOC providers might wish to take into account [18].

A plausible path would be the improvement of pedagogical-technological solutions. What is needed are new methodologies for development and interpretation of models that bridge expertise from machine learning and language technologies on one side and learning sciences, sociolinguistics, and social psychology on the other side [5]. Self- and peer assessment might offer promising solutions that can scale the grading of complex assignments in courses with thousands of students. Moreover, intermediate assessments might engage more students with participating in a course [21]. Nevertheless, another school of thought, mainly academic, places its focus on aspects like: pedagogical design of the MOOCs, the roles of the teacher and student in these massive courses, the high rate of drop-outs in MOOCs, the difficulty to confirm the physical personality of the participants, the limited validity of the accreditations [2].

In a world increasingly multidimensional and diverse, MOOCs can work in universities as a piece of the system providing open learning opportunities, forming part of the learners' personal learning network [18]. The large scale linguistic data that is generated by discussion boards, blogs, and other written language-based interaction tools that are/can be part of the MOOC technology infrastructure provides an unprecedented opportunity to study the dynamics of students' interaction, learning engagement, and ways in which critical valuable learning/teaching discourse is constructed around different knowledge topics [16]. Beyond that, automated analyses enable adaptive technology to tailor the experience of users in real time [5]. Incidentally, we can explore at a micro level whether, and how, cognitive mind states govern the formation and occurrence of micro level click patterns [20].

V. WHAT TYPE OF DATA ARE WORTH ANALYZING IN LINE WITH A COURSE?

The aforementioned instances of research reveal that the key to a successful course is to be found in the learners' motivation and behavior. The questionable fields can be assessed by post testing whose drawback is the timing of data-result recording that happens long after taking the test; as a result, the participants would forget how they approached and completed a task, or how they reached a correct or a wrong answer [10]. Besides, post testing that aims at studying behavior and opinion show significant discrepancies during an instantaneous and a follow-up feedback making it impossible to draw a reliable and clear picture [15]. Knowing this, it would be highly necessary to investigate other logging methods that are capable of real-time data collection. Results obtained through

such tools "without the knowledge" of the user would feed objective data to the researchers. Such a solution was demonstrated by Sinha et. al. [20] who recorded mouse activity during video streaming and analyzed the results afterwards. We could also mention who conducted a survey to unfold the perspectives of education through video lectures. A MOOC course, however, would require to bring forth the traditional textual and presentation based teaching, thus it might be wise to carry out a logging study while students are reading. Furthermore, forums may also contain some useful information, though forums at MOOC courses are the least used opportunities to engage in communication that barely reaches 5%, still it may carry useful information on students' communication habits on forums [12].

VI. CONCLUSION

To conclude, several studies in this paper support the hypothesis that video supported digital learning is gradually gaining ground and popularity. We should not forget however that the drop-out rate and the rate of discarding a course are significantly high, which is the current drawback of MOOC courses [18]. It is thus imperative to track all the conditions that lead to a successful completion of a course.

The instances of research mentioned in this paper reveal that the key to a successful course is to be found in learners' motivation and behavior. Academic papers published on this issue are useful to an extent; however, educators with "basic training" in this field would usually miss the opportunity to show a significant development in this area during their everyday work. As a consequence, future MOOC platforms have to be supplemented with logging and automated statistical algorithms, beside esthetic and pedagogical implementations in order to track students in real time.

Based on pieces of research in the academic literature, we are able to establish a list of the most important logging categories:

- Attitudes and forms of behavior during viewing a video

- Learners' activity on a course forum

- Textual and slide based learning materials and the attitudes how they are approached, and forms of behavior.

REFERENCES

[1] A. Anders, "Theories and Applications of Massive Online Open Courses (MOOCs): The Case for Hybrid Design", International Review of Research in Open and Distance Learning, vol. 16(6), pp. 39-61.

[2] Á. Fidalgo-Blanco, M. Luisa Sein-Echaluce, and F. J. García-Peñalvo, "Methodological approach and technological framework to break the current limitations of mooc model", Journal of Universal Computer Science, vol. 21, no. x (2015), pp. 712-734.

[3] A. Fini, "The technological dimension of a massive open online course: the case of the cck08 course tools", International Review of Research in Open and Distance Learning, vol. 10(5), pp. 74-96.

[4] B. Stewart, "Massiveness + openness = New literacies of participation?", MERLOT Journal of Online Learning and Teaching, vol. (2), pp. 228-238.

[5] C. P. Rosé , and G. Siemens, "Shared task on prediction of dropout over time in massively open online courses", 2014 Conference on Empirical Methods in Natural Language Processing (EMNLP), Doha, Qatar, pp. 61-72, October 2015.

[6] D. Simonyi, P. Esztelecki, and G. Kőrösi, "Van önnek facebook profilja, tanár úr? a didaktikai háromszög online vetületei," VII. Oktatás-Informatikai Konferencia, ELTE Pedagogikum Központ, ELTE Pedagógiai És Pszichológiai Kar, Budapest, pp. 357-372, May 2015

[7] D. Sir John, and S. Uvalić-Trumbić, "Are MOOCs the long-awaited technological revolution in higher education?", Digital Transformations Conference Montreal, pp. 1-19, October 2014.

[8] E. Allen, and J. Seaman, "Grade change: tracking online education in the United States", Babson Survey Research Group and Quahog Research Group, LLC., 2014

[9] E. Schultz, "The potential and problems of moocs", Beiträge zur Hochschulpolitik vol. 2/2014.

[10] G. Kőrösi, "A digitális oktatási módszerek hatásfokának felmérése az eye-tracking technológia segítségével", Létünk, Serbia, Novi Sad, vol. 2015/4, pp. 51-59.

[11] G. Kőrösi, "Tanár nélküli tanulás a jövő iskolájában? az online videó oktatási jellegûalkalmazásának lehetôségi és buktatói," VII. Nemzetközi XIII. Országos Interdiszciplináris Konferencia, PTE Grastyán Endre Szakkollégium, Pécs, pp. 146-153, April 2015.

[12] J, E. Klobas ,"Measuring the success of scaleable open online courses", Performance Measurement and Metrics, Vol. 15/3, pp. 145-162.

[13] L. Johnson, S. A. Becker, M. Cummins, V. Estrada, A. Freeman, and H. Ludgate, "NMC Horizon report: 2013 higher education edition", Austin, Texas: The New Media Consortium, 2013.

[14] M. O. M.El-Hussein, and J. C. Cronje, "Defining mobile learning in the higher education landscape", Educational Technology, Society, Cape Town, South Africa pp. 12–21. 2010.

[15] M. Robert, "Strategies for educational inquiry", Indiana University, Bloomington, pp. 34-48, 2010.

[16] N. Elouazizi, "Point-of-view mining and cognitive presence in moocs: a (computational) linguistics perspective",2014 Conference on Empirical Methods in Natural Language Processing (EMNLP), Doha, Qatar, pp. 38-45, October 2015.

[17] S. Moon, S. Potdar, and L. Martin, "Identifying Student Leaders from MOOC Discussion Forums through Language Influence", 2014 Conference on Empirical Methods in Natural Language Processing (EMNLP), Doha, Qatar, pp. 81-89, October 2015.

[18] S. White, H. Davis, K. Dickens, M. León, and M. M. Sánchez-Ver, "Moocs: what motivates the producers and participants?", Computer Supported Education Vol. 510, of the series Communications in Computer and Information Science, pp. 99-114.

[19] T. R. Liyanagunawardena, A. A. Adams, and S. A. Williams, "MOOCs: A systematic study of the published literature 2008-2012", International Review of Research in Open and Distance Learning, vol. 14(3), pp. 202-227, October 2013.

[20] T. Sinha , P. Jermann , N. Li , and P. Dillenbourg, "your click decides your fate: inferring information processing and attrition behavior from mooc video clickstream interactions" , 2014 Conference on Empirical Methods in Natural Language Processing (EMNLP), Doha, Qatar, pp. 53-59, October 2015.

[21] W. Admiraal , B. Huisman, and O. Pilli, "Assessment in massive open online courses," Electronic Journal of e-Learning, vol. 13, pp. 207-216.

[22] Y. Bergner, D. Kerr, and D. E. Pritchard, "Methodological challenges in the analysis of mooc data for exploring the relationship between discussion forum views and learning outcomes", The 8th International Conference on Educational Data Mining EDM 2015, Madrid, Spain, pp. 181-189, June 2015.

[23] Zs. Námesztovszki, G. Kőrösi Gábor, P. Esztelecki, A. Vinkó, and C. Kovács, "Tapasztalatok és következtetések egy kísérleti mooc kapcsán", VII. Oktatás-Informatikai Konferencia, ELTE Pedagogikum Központ, ELTE Pedagógiai És Pszichológiai Kar, Budapest, pp. 302-314, May 2015.