OUTLINING PARTICIPATION IN THE FIRST MOOC OF THE UNIVERSITY OF THE AEGEAN: A CASE STUDY

Giasiranis Stefanos¹, Sofos Alivizos²
¹Doctoral Candidate, Department of Primary Education, University of the Aegean, Greece
²Professor, Department of Primary Education, University of the Aegean, Greece

Abstract:
Twelve years after the advent of MOOCs, the University of the Aegean (Greece) implemented its first MOOC on “Violence and bullying in schools”, in which about 2,000 people showed interest in attending. Eventually, 1309 people started it and 1050 (80.21%) completed it successfully, achieving high performance. The present work, which is part of the doctoral research of the first researcher, outlines the participation of the learners in the program and the obstacles they encountered during it while identifying the reasons for its high completion rate with high performance. The results showed that mainly the quality of the instructional material, the instructional design of the program, and its organization, as well as the timely support provided to learners, contributed significantly to the successful completion of the program achieving high performance. These findings can be considered by future MOOC program designers, in order to design and implement programs that meet the requirements and facilitate the participation of those who attend.

Keywords: MOOCs, distance education, self-regulation, SRL, instructional design

Περιλήψη:
Δώδεκα χρόνια μετά την εμφάνιση των MOOCs, το Πανεπιστήμιο Αιγαίου υλοποίησε το πρώτο του MOOC με θέμα την Ενδοσχολική βία και τον εκφοβισμό, στο οποίο εκδήλωσαν ενδιαφέρον για να το παρακολουθήσουν περίπου 2000 άτομα. Τελικά, το ξεκίνησαν 1309 άτομα και το ολοκλήρωσαν επιτυχώς 1050 (80,21%), πετυχαίνοντας υψηλές επιδόσεις. Η παρουσία εργασία, που αποτελεί τμήμα της διδακτορικής έρευνας των MOOCs, σκαγγάφει τη συμμετοχή των

¹ Correspondence: email giasiranisst@gmail.com
MOOCs are online courses offered for free over the Internet. MOOC is considered the "Connectivism and Connective Knowledge" course developed by Siemens and Downes (Yuan & Powell, 2013). Today, MOOCs are developed primarily by well-known tertiary institutions and are attended by hundreds to thousands of people around the world. Those who enroll in one of the programs hosted on online platforms, do not pay tuition fees nor some criteria are required to attend them even if their creator suggests the possession of specific knowledge and skills in order their content to be understood. Their learning material is offered through small videos, slides, or other digital files (Hoy, 2014). For the evaluation of the learners, assignments are assigned that are graded by graduates, teachers or other learners, and/or small quizzes of closed questions that are automatically graded by computers are used. Upon successful completion of the program, an informal electronic certificate or an official one is provided free of charge upon payment and participation in examinations (Karnouskos & Holmlund, 2014).

Despite the ease of access and the training opportunities they offer, a very small percentage manage to complete them. Globally, completion rates range from 5-15% (Jordan, 2013). The obstacles that the learners face during the courses and lead to their abandonment are lack of time (Fini, 2009; Kop, Fournier, & Mak, 2011; Belanger & Thornton, 2013; Cross, 2013; Grainger, 2013; Zutshi, O’Hare, & Rodafinos, 2013; Beaven, Crodreanu, & Creuzé, 2014; Cassidy, Breakwell, & Bailey, 2014; Gütl, Rizzardini, Chang, & Morales, 2014; Nawrot & Doucet, 2014; Schulze, 2014; Kizilcec & Halawa, 2015; Skrypnyk, de Vries, & Hennis, 2015; Zheng, Rosson, Shih, & Carroll, 2015; Veletsianos, Reich, & Pasquini, 2016; Kizilcec & Cohen, 2017; Shapiro, et al., 2017) and the delay in their schedule due to other obligations (Nawrot & Doucet, 2014; Kizilcec & Halawa, 2015), the absence of a cognitive background that would allow the understanding of new information (Belanger & Thornton, 2013; Gütl et al., 2014; Park, Jung, & Reeves, 2015; Shapiro, et al., 2017), the quality and difficulty of learning material and
assessments (Belanger & Thornton, 2013; Gütl, et al., 2014; Nawrot & Doucet, 2014; Schulze, 2014; Park, et al., 2015; Skrypnyk, et al., 2015; Whitehill, Williams, Lopez, Coleman, & Reich, 2015; Zheng, et al., 2015; Huang & Hew, 2016; Veletsianos, et al., 2016), the course design (Gütl, et al., 2014; Nawrot & Doucet, 2014; Park, et al., 2015), the absence of the awareness of the absence of formal recognition of their knowledge (Schulze, 2014; Gamage, Fernando, & Perera, 2015), the absence but also the quality of feedback/assistance either from other learners or from teaching and support staff (Gütl, et al., 2014; Schulze, 2014; García, Tenorio, & Ramírez, 2015; Tomkin & Charlevoix, 2014; Park, et al., 2015), the lack of communication with teaching staff (Kop, et al., 2011; Gütl, et al., 2014), lack of motivation from third parties (Gütl, et al., 2014), the absence of a sense of community (Gütl, et al., 2014; Nawrot & Doucet, 2014; Zheng, et al., 2015) and the difficulty of collaborating (Zutshi, et al., 2013; Koutsodimou & Tzimogiannis, 2016). However, some learners may leave the program, not because they faced any of the above difficulties and obstacles, but because they achieved the goal for which they participated, before the completion of the program (Nawrot & Doucet, 2014; Schulze, 2014; Kizilcec & Halawa, 2015; Whitehill, et al., 2015) or why they realized that the program did not meet their needs (Schulze, 2014; Whitehill, et al., 2015).

In the present work, the participation in the first MOOC program of the University of the Aegean on "Violence and bullying in schools", lasting eight (8) weeks, which was implemented in the framework of the first researcher's doctoral research and hosted on an OpenEdx platform on our University server.

1.1 Instructional design

In the modern concept of teaching, all its parts (instructor, students, learning material, learning environment) have a critical role and any change in one of them can affect the rest, but also the final learning outcome. That is, they function as a system and a way to improve the learning outcome is through instructional design (Dick, Carey, & Carey, 2015).

In online learning environments, where lessons are conducted via the Internet, instructional design is considered necessary, as it systematizes the development process of these programs and contributes to achieving the learning goals that have been set (Sofos, Kostas, & Paraschou, 2015) ensuring that the educational material created is effective and suitable for the educational needs of the trainees.

One of the instructional design models we relied on to develop our own program is Dick, Carey, & Carey's "Systems Approach Model". The model is completed in ten different steps that can be followed linearly, cyclically, or in parallel (Dick, et al., 2015) and are as follows:

1. identification of instructional goals. Instructional goals are more generally articulated in relation to performance goals. Therefore, an educational goal may equate to a set of performance goals (Oosterhof, 2010) achieved through the achievement of the performance goals associated with (Sofos, et al., 2015)
2. conducting an instructional analysis, during which the educational goals of the previous step are analyzed and the steps for their achievement are determined, as well as the skills, knowledge, and attitudes that the learners must possess in order to achieve them to the maximum extent
3. analysis of the learners and the context, during which the learning characteristics of the learners and the educational context in which they will learn and apply their new knowledge/skills are clarified
4. setting performance objectives, that is, what learners will be able to do, as well as the ways in which it will be demonstrated that they can do it
5. development of assessment instruments, which will examine the degree of achievement of the performance objectives of the previous stage
6. development of the instructional strategy that will lead to the achievement of the performance objectives. The instructional strategy may include pre-learning activities to mobilize learners and increase their interest, activities of presenting new learning material, activities of active participation in the learning process, practice and reflection, and activities of evaluating new knowledge and applying it in real conditions
7. development and/or selection of the instructional material based on which the instructional strategy of the previous stage will be implemented
8. development and construction of formative evaluation that will identify potential problems in instructional planning and possibilities for further improvement
9. review of the instructional intervention, based on the results of the formative evaluation, which will allow its improvement
10. developing and conducting a summative evaluation, which as a step does not belong to the design process, however, it is necessary to draw conclusions about the success or not of the teaching

1.3 Instructional design and organization of the program MOOC
Following the instructional design of Dick, et al. (2015) we implemented a MOOC program of eight (8) weekly modules on “Violence and Bullying in schools”, which was addressed to current teachers and education staff, students of pedagogical schools, but also to anyone interested.

The instructional design of each weekly unit of the program included:
1. instructional goals for what the learners were expected to achieve by attending each module.
2. short introductory video (up to 2 minutes) that summarized the highlights of the previous week and informed about the topic and goals of the week that was starting.
3. motivational activities that motivated the learners to submit their previous views, knowledge, attitudes, experiences and to develop a dialogue between them.
4. the main instructional material with short videos of up to 6 minutes with built-in slides that highlighted the main points that were heard or presented other
explanatory elements (graphs, sketches, etc.). Videos with facts, testimonies, simulations, and analogies were also used as examples to explain the concepts presented in the main instructional material.

5. a multiple-choice quiz of 5-10 questions of knowledge, understanding, application, evaluation, analysis, and composition of data, after each video. Each response provided feedback justifying the correctness or error of each response.

6. one or more optional activities that led to the recall of the knowledge presented and their application to address incidents of violence and bullying in schools (case studies).

7. a final assignment of 300-500 words at the end of each weekly unit that included open-ended questions aimed at analyzing, synthesizing, and applying knowledge to resolve incidents of violence and bullying in schools. The assignments were evaluated by the other learners (peer review).

8. additional educational material to deepen the knowledge presented.

During the program, there was ongoing support and assistance to the learners either through the discussion forum or through the program e-mail support. At the end of each week, the learners received an e-mail informing them of issues that concerned them, urging them to continue the program, summarizing the knowledge of the completed section, and informing them about the topic of the next section.

In the end, it was planned to provide an official certificate of successful completion of the program to those who successfully completed it (performance= 70%, participation in all quizzes).

The program was hosted on an OpenEdx platform that we installed on a server of the University of the Aegean.

1.4 The course
1.4.1 The period before the beginning of the program
The announcement of the program and the invitation for enrollment was made through the website of the University of the Aegean, but also through an informative e-mail sent to all the Directorates of Primary and Secondary education, as well as to the secretariats of the Pedagogical departments of the universities.

The registration period lasted approximately two (2) weeks (15/1/2020 - 31/1/2020). In total, 1952 people registered on the platform of the programii. From the people who registered, their account was activated by 1863 people who were informed in various ways to answer the initial questionnaires (two) of the survey for their registration to be considered valid. Of the 1863 individuals, some did not respond at all (N = 176, f = 9.0%), some answered only one of the two questionnaires (N = 87, f = 4.5%), while some others, although both questionnaires answered, they never started the program (N = 291, f = 14.9%). As a result, they were excluded from the rest of the process. Of the people who did not continue, only 15 had difficulty with their registration process or completing the

ii https://oedx-n3.rhodes.aegean.gr/
questionnaires and despite the support provided to them, they eventually failed to understand the process they had to follow and left the program.

1.4.2 The period during the program
When the course started, some learners never showed up, either because they thought the course platform was different from the questionnaire completion platform, or because they were waiting for some notice that the course had started, despite an informational e-mail being sent three days before the start of the course, or finally, for various personal reasons. Typical are the e-mails sent in support of the program "Good evening; I will not take part in this seminar. Thank you very much" or "I would like to inform you that I will not be able to attend this program for personal reasons. For this reason, I did not consent to complete the survey questionnaires. Sorry. Good luck to your work". The majority, however, did not inform about the reasons why they decided not to participate.

Of the 932 learners of the control group and the 931 learners of the experimental group who were automatically distributed to the research groups by the OpenEdx platform upon activation of their account, the program was finally started by 659 (35.4%) and 650 (34.9%) learners from the control and the experimental group, respectively. A total of 273 people (14.7%) from the control group and 281 (15.1%) from the experimental group left without participating in any of the activities of the program.

By the 4th week (middle of the program), another 119 (f = 18.1%) and 118 people (f = 18.2%) from the control group and the experimental group, respectively, left the program. Most stopped mainly in the first week (N = 154, f = 59.5%), as in many other studies (Ho, et al., 2014; Perna, et al., 2014; Morris, Hotchkiss, & Swinnerton, 2015; Davis, Chen, Jivet, Hauff, & Houben, 2016), due to lack of interest and motivation to continue or simply because they participated in the program out of curiosity (Grainger, 2013; Perna, et al., 2014). At the end of the 4th week, 91.5% (N = 237) of those who left the program after it started (N = 259) or 18.1% of those who started it, had left (N = 1309). Drop out until the 2nd to 3rd module of the program has been identified in many other studies (Cassidy, et al., 2014; Gütl, Rizzardini, Chang, & Morales, 2014; Santos, Klerkx, Duval, Gago, & Rodriguez, 2014; Greene, Oswald, & Pomerantz, 2015; Jordan, 2015; Skrypnyk, et al., 2015; Evans, Baker, & Dee, 2016; Hone & El Said, 2016; Maldonado, et al., 2016; Tseng, Tsao, Yu, Chan, & Lai, 2016; Tawfik, et al., 2017).

Then the situation stabilized, as there is a very small rate of drop out. During the second half of the program, another 12 learners left the control group (f = 1.8%), while another 10 learners left the experimental group (f = 1.5%).

The reasons for leaving the program are personal, "I inform you that I lost my father and I will not be able to watch the program" or "Unfortunately, I can no longer attend the course due to the extraordinary circumstances (mean the COVID-19 pandemic). You can delete my account", due to health problems, "I want to quit the program because I do not have time due to serious health issues" or due to lack of time "... I am a primary school teacher. I started the seminar with a lot of appetites because I liked the topic. However, handling the material of the 1st week, I found it very stressful and demanding. At this time, I cannot respond adequately, for this
reason, I will stop here.". Sometimes communication with them helped them to continue
the program, other times, no.

Finally, 1050 learners successfully completed the program, 528 from the control
group, and 522 from the experimental group. To calculate the completion rates, a
different way is followed by each researcher (Grainger, 2013). One of them is to consider
the initial number of people enrolled in the program, resulting in small completion rates.
Another one, which we also adopted, is to consider the number of people who completed
the program in relation to those who participated in, at least, one activity of the program.
Based on this calculation, 80.1% (N = 528) from the control group and 80.3% (N = 522)
from the experimental group successfully completed the program, while in total, the
program was completed by 80.2 % (N = 1050) of those who started it. This percentage is
very high in relation to the percentage of people who complete MOOCs according to the
literature, which ranges from 5-15% (Jordan, 2013).

Regarding the participation of the learners in the program, there is a significant
increase of those connected to the platform during the weekend as well as in the research
of Ferdig, Pytash, Merchant and Nigh (2014), culminating on Monday, the day of
activation of each weekly unit. The reasons for the large number of visitors on Monday
are either the anxiety about the content of the new section or from anticipation ("Two
months full of knowledge! I learned so much that if I apply up to half, I will have greatly improved
my daily school life. This seminar was free and the most exciting, substantial, and interesting
which I have done so far both in its presentation and in its quality. Every Monday I was looking
forward to opening every week!"). During the week, the participation decreases gradually,
with a turning point approximately in the middle of the week. This pattern of
participation has been highlighted in other studies too (Breslow, et al., 2013; Anderson,
Huttenlocher, Kleinberg, & Leskovec, 2014). In general, greater participation is observed
in the first weeks of courses (Wong, Pursel, Divinsky, & Jansen, 2015).

The submission of the final weekly assignment is done on time, except maybe in
the 1st week during which they were not yet familiar with the program and its
requirements. Mainly, they submit the works on the first Sunday, and less on the 2nd,
when they have the right to submit them. The problems that arose, mainly, in the
beginning, were due to the submission process, to some questions that needed
clarification, and to the peer review process, which some accepted as a process of self-
improvement, while others expressed their objections, sometimes strongly and
sometimes less intensely. However, the problem was largely created by some participants
who did not take the time to properly evaluate the work of their colleagues based on the
criteria set (rubric), creating them negative emotions. Many, in fact, would have stopped
participating if their work had not been re-evaluated by the researcher, at their request.

Participation in non-graded activities is much lower than participation in quizzes
and final assignments. They are more involved in motivational activities and less in
optional activities. Perhaps the name "optional" also played a role in this, as in the
research of Evans, et al., (2016) in which videos containing the word "optional" in their
title were rarely watched in relation to the rest. About half of the people involved in these
activities made mostly one post per topic. However, there were also posts with many more answers, an indication that dialogue was created between them. In general, however, everyone creates their own post, instead of responding to another, creating parallel monologues, as was pointed out in the final comments “If I have to say something ‘negative’ it would be that in the discussion and in the optional activities I would prefer to write in a continuous stream and not by adding everyone’s post, because it was a bit tedious to open and close it and usually did not start a dialogue with “I agree” that we all wrote, at least once, in the beginning”.

The videos with the built-in explanatory slides they contained had a positive acceptance (“Colleagues presented the topics nicely by filling them in with slides, there was an alternation of videos, slides, etc. and this was more interesting.”), as well as the quizzes as a means of self-assessment, although some points were pointed out in the formulation of the questions that were difficult and would like to change, the motivational activities (“The motivational activities, the tests and the final weekly assignments gave us the opportunity to make mistakes, to reflect, but above all to experience our knowledge.”), the optional activities as a means of motivating dialogue, sharing experiences, practices and knowledge (“I liked that there were the optional activities because it was an opportunity to express and interact with colleagues.”), and the final weekly assignments, although they were described as demanding but useful (“The quizzes helped me to consolidate everything I had studied. The final weekly assignments were very useful as I put into practice everything I was learning.”).

Participation in the forum is very small and takes place mainly from Friday to Monday (turning point: Thursday), as in the research of Ferdig, et al., (2014). Some learners stayed only on the home page, ignoring the existence of the other topics that were posted. Many questions raised had already been answered in the forum, but many learners had not identified them. Also, few took the time to see if the problem they were facing had already been discussed. Few learners took the lead in the forum, helping other colleagues. Maybe the time one had to dedicate, played a catalytic role here as well.

Their emotions alternate during the lessons. Some people feel happy and satisfied either because they achieved their goal or because they were evaluated with a high grade. Emotions change when they are pressured by the schedule or when they receive scores below their expectations.

Grouping the participants according to the way they participate in the program, the following categories are identified:

• the Eager, who enrolled in the program but never participated in it
• The Silent ones who attended the program but their presence during the program does not become apparent either by an e-mail or by a post in the forum
• the Active who participated in all activities
• and the Fugitives who left the program after starting it

The Amnuayponsaikut, Bhat and Chinpruthitwiwong (2014) and Jivet (2016) surveys identified similar categories of participants. In our research, however, no people were found who attended the program without participating, at least in its mandatory activities, as obtaining the certificate of successful completion was a strong incentive to
try to achieve the 70% performance limit. Those who realized that they could not achieve this usually left the program. Another reason that this category of participants did not exist is that the design of the program did not allow it, as in order for a learner to unlock the modules of the program he had to participate, at least, in the research that was conducted in parallel.

1.4.3 The period after the end of the program
The performance of the learners is high. Only 48 people did not reach the 70% threshold to receive the certificate of successful completion of the program. In contrast, the majority achieved a performance of over 80%, with no statistically significant differences between the research groups. There were no statistically significant differences even between the final performance of those who achieved the 70% limit.

Those who successfully completed the program are possessed by positive emotions, enthusiasm, and joy, because they acquired the knowledge they expected, but also because they were completely satisfied with the overall organization and implementation of the program. In fact, some people think of continuing to be educated on the same subject ("Thanks to this structured program I learned how to recognize, prevent, and deal with such phenomena. At the same time, I developed an appetite and desire to further educate myself on this issue as well as and others related to contemporary school reality "), confirming the findings of other research (Belanger & Thornton, 2013; Tomkin & Charlevoix, 2014; Koutsodimou & Tzimogiannis, 2016).

2. Discussion

Regarding the participation of the learners in the program, what Clow (2013) likened to a funnel to represent the continuous decrease of the trainees is observed. Nevertheless, a very large percentage of people completed the program. This result, but also the high performance, is due not only to one factor but to a combination of factors such as, the good design of the program (Khalil & Ebner, 2013; De Barba, Kennedy, & Ainley, 2016), its average duration (Jordan, 2014; Jordan, 2015), the short duration of videos (Kim, et al., 2014; Thille, et al., 2014; Guo, Kim, & Rubin, 2014; Hone & El Said, 2016) and their type (with explanatory slides) (Kim, et al., 2014; Guo, et al., 2014), the type of evaluations they included (peer evaluation) (Jordan, 2015), the satisfaction of the learners from the program and the educational material (Whitmer, Schiorring, & James, 2014; Alraimi, Zo, & Ciganek, 2015; Hew, 2016; Hone & El Said, 2016), their motivations and goals (Belanger & Thornton, 2013; Cisel, 2014; Fournier, Kop, & Durand, 2014; Schulze, 2014; Xiong, et al., 2015; Huang & Hew, 2016) and their degree of achievement (Wilkowski, Deutsch, & Russell, 2014), their learning background (Breslow, et al., 2013; Cassidy, et al., 2014; Guo & Reinecke, 2014; Goldberg, et al., 2015; Greene, et al., , 2015; Kennedy, Coffrin, De Barba, & Corrin, 2015; Kizilcec & Halawa, 2015; Morris, et al., 2015; Cunningham, Bitter, Barber, & Douglas 2017), their interest and knowledge they already had about the subject (Engle, Mankoff, & Carbrey, 2015; Hood, Littlejohn, & Milligan, 2015; Kizilcec & Halawa, 2015;
Egloffstein & Ifenthaler, 2017), their participation in peer reviews (Stein & Allione, 2014; Cisel, 2014; Allione & Stein, 2016), the ongoing support provided to them (Kop, et al., 2011; Belanger & Thornton, 2013; Castano-Munoz, Kalz, Kreijns, & Punie, 2016; Hadi & Rawson, 2016; Hew, 2016; Hone & El Said, 2016), their (timely) feedback (Fournier, et al., 2014; Ramesh, Goldwasser, Huang, Daume & Getoor, 2014; Wilkowski, et al., 2014; Davis, et al., 2017), the connection of theory and practice through the case studies they were asked to deal with (Hew, 2016), the hints and feedback provided in the quizzes and the final weekly assignments (Koedinger, Kim, Jia, McLaughlin, & Bier, 2015), the program’s evaluation policy (Li, Kidziński, Jermann, & Dillenbourg, 2015), the moderate workload required by the program other than the first two weeks when the program was more demanding (Cassidy, et al., 2014), even their interest in obtaining the official certificate of completion (Haug, Wodzicki, Cress, & Moskaliuk, 2014; Castano-Munoz, et al., 2016; Greene, et al., 2015; Pursel, et al., 2016).

These factors and especially their interest in the program, the quality of the instructional material, the instructional design of the program, and its organization, contributed significantly to the successful completion of the program achieving high performance. These factors, in combination with the ongoing support and assistance to learners of the problems and difficulties encountered during the programs, should be taken into account by future program designers, in order to implement programs that meet the requirements of the learners, facilitating them to complete them.

Conflict of Interest
The authors can assure, confidently express that no conflicts of interest possibly linked with this research, and there has been no financial aid received for this study, authorship and publication that could have influenced the study’s outcome. The authors affirm that this research is original and has not been published in the past or elsewhere.

About the Author(s)
Giasiranis Stefanos (PhD Candidate) is a computer science teacher of secondary education and a graduate of the postgraduate program “Education Sciences-Education with the use of New Technologies”, Department of Primary Education, School of Humanities, University of the Aegean, Greece. This period he is in the final stages of his doctoral research entitled, “Self-Regulated Learning and MOOCs: An alternative proposal to non-formal education”.

Alivizos Sofos (PhD) is Professor at the Department of Primary Education, University of the Aegean. Currently, he serves as Chairman of the Department and as Director of the Postgraduate Program “Education Sciences-Education with the use of New Technologies”. His research interests include Media Pedagogy, Initial Teacher Education, Online Distance Education, etc.
References

Allione, G., & Stein, R. M. (2016). Mass attrition: An analysis of drop out from principles of microeconomics MOOC. The Journal of Economic Education, 47(2), 174-186. DOI: 10.1080/00220485.2016.1146096

Alraimi, K. M., Zo, H., & Ciganek, A. P. (2015). Understanding the MOOCs continuance: The role of openness and reputation. Computers & Education, 80, 28-38. doi:10.1016/j.compedu.2014.08.006

Amnueypornsakul, B., Bhat, S., & Chinprutthiwong, P. (2014, October). Predicting attrition along the way: the UIUC model. In Proceedings of the EMNLP 2014 Workshop on Analysis of Large Scale Social Interaction in MOOCs (pp. 55-59).

Anderson, A., Huttenlocher, D., Kleinberg, J., & Leskovec, J. (2014, April). Engaging with massive online courses. In Proceedings of the 23rd international conference on World wide web (pp. 687-698). ACM.

Beaven, T., Codreanu, T., & Creuzé, A. (2014). Motivation in a language MOOC: issues for course designers. Language MOOCs: Providing Learning, Transcending Boundaries. Berlin: De Gruyter Open, 48-66.

Belanger, Y., & Thornton, J. (2013). Bioelectricity: A quantitative approach Duke University’s first MOOC.

Breslow, L., Pritchard, D. E., DeBoer, J., Stump, G. S., Ho, A. D., & Seaton, D. T. (2013). Studying learning in the worldwide classroom: Research into edX’s first MOOC. Research & Practice in Assessment, 8.

Cassidy, D., Breakwell, N., & Bailey, J. (2014). Keeping them clicking: Promoting student engagement in MOOC design. The All Ireland Journal of Teaching and Learning in Higher Education, 6(2), 1-15.

Castano-Munoz, J., Kalz, M., Kreijns, K., & Punie, Y. (2016). Influence of employer support for professional development on MOOCs enrolment and completion: Results from a cross-course survey. Research Track (pp. 251-263)

Cisel, M. (2014). Analyzing completion rates in the first French xMOOC. Proceedings of the European MOOC Stakeholder Summit, 26.

Clow, D. (2013, April). MOOCs and the funnel of participation. In Proceedings of the Third International Conference on Learning Analytics and Knowledge (pp. 185-189). ACM.

Cross, S. (2013). Evaluation of the OLDS MOOC curriculum design course: participant perspectives, expectations and experiences. OLDS MOOC Project, Milton Keynes Cunningham, J. A., Bitter, G., Barber, R., & Douglas, I. (2017). Using Traces of Self-Regulated Learning in a Self-Paced Mathematics MOOC to Predict Student Success.

Davis, D., Chen, G., Jivet, I., Hauff, C., & Houben, G. J. (2016). Encouraging Metacognition & Self-Regulation in MOOCs through Increased Learner Feedback. In LAL@ LAK (pp. 17-22).
Davis, D., Jivet, I., Kizilcec, R. F., Chen, G., Hauff, C., & Houben, G. J. (2017, March). Follow the successful crowd: raising MOOC completion rates through social comparison at scale. In LAK (pp. 454-463). DOI: 10.1145/3027385.3027411

De Barba, P. G., Kennedy, G. E., & Ainley, M. D. (2016). The role of students’ motivation and participation in predicting performance in a MOOC. Journal of Computer Assisted Learning, 32(3), 218–231. doi:10.1111/jcal.12130

Dick, W., Carey, L., & Carey, J. O. (2015). The systematic design of instruction (8th edition). Upper Saddle River, NJ: Pearson.

Egloffstein, M., & Ifenthaler, D. (2017). Employee perspectives on MOOCs for workplace learning. TechTrends, 61(1), 65.

Engle, D., Mankoff, C., & Carbrey, J. (2015). Coursera’s introductory human physiology course: Factors that characterize successful completion of a MOOC. The International Review of Research in Open and Distributed Learning, 16(2).

Evans, B. J., Baker, R. B., & Dee, T. S. (2016). Persistence patterns in massive open online courses (MOOCs). The Journal of Higher Education, 87(2), 206-242.

Ferdig, R. E., Pytash, K. E., Merchant, W., & Nigh, J. (2014). Findings and reflections from the K-12 teaching in the 21st century MOOC. Recuperado el, 1.

Fini, A. (2009). The technological dimension of a massive open online course: The case of the CCK08 course tools. The International Review of Research in Open and Distributed Learning, 10(5).

Fournier, H., Kop, R., & Durand, G. (2014). Challenges to research in MOOCs. Journal of Online Learning and Teaching, 10(1), 1.

Gamage, D., Fernando, S., & Perera, I. (2015, August). Factors leading to an effective MOOC from participants’ perspective. In Ubi-Media Computing (UMEDIA), 2015 8th International Conference on (pp. 230-235). IEEE.

Garcia, B. J., Tenorio, G. C., & Ramírez, M. S. (2015). Self-motivation challenges for student involvement in the Open Educational Movement with MOOC. RUSC. Universities and Knowledge Society Journal, 12(1). pp. 91-103. doi:10.7238/rusc.v12i1.2185

Goldberg, L. R., Bell, E., King, C., O’Mara, C., McNerney, F., Robinson, A., & Vickers, J. (2015). Relationship between participants’ level of education and engagement in their completion of the Understanding Dementia Massive Open Online Course. BMC medical education, 15(1), 60. DOI: 10.1186/s12909-015-0344-z

Grainger, B. (2013). Massive open online course (MOOC) report. London, UK: University of London International Programmes. Retrieved from http://www.londoninternational.ac.uk

Greene, J. A., Oswald, C. A., & Pomerantz, J. (2015). Predictors of retention and achievement in a massive open online course. American Educational Research Journal, 52(5), 925-955.

Guo, P. J., & Reinecke, K. (2014, March). Demographic differences in how students navigate through MOOCs. In Proceedings of the first ACM conference on Learning@ scale conference (pp. 21-30). ACM.
Guo, P. J., Kim, J., & Rubin, R. (2014, March). How video production affects student engagement: An empirical study of MOOC videos. In Proceedings of the first ACM conference on Learning@ scale conference (pp. 41-50). ACM.

Gütl, C., Rizzardini, R. H., Chang, V., & Morales, M. (2014, September). Attrition in MOOC: Lessons learned from drop-out students. In International Workshop on Learning Technology for Education in Cloud (pp. 37-48). Springer, Cham.

Hadi, S. M., & Rawson, R. (2016). Driving learner engagement and completion within MOOCs: a case for structured learning support. Proceedings of the European Stakeholder Summit on experiences and best practices in and around MOOCs (EMOOCS 2016), 81.

Haug, S., Wodzicki, K., Cress, U., & Moskaliuk, J. (2014). Self-regulated learning in MOOCs: Do open badges and certificates of attendance motivate learners to invest more. U., & CD (Eds.), EMOOCs, 66-72.

Hew, K. F. (2016). Promoting engagement in online courses: What strategies can we learn from three highly rated MOOCS. British Journal of Educational Technology, 47(2), 320-341. doi:10.1111/bjet.12235

Ho, A., Reich, J., Nesterko, S., Seaton, D., Mullaney, T., Waldo, J., & Chuang, I. (2014). HarvardX and MITx: The first year of open online courses, fall 2012-summer 2013. Ho, AD, Reich, J., Nesterko, S., Seaton, DT, Mullaney, T., Waldo, J., & Chuang, I.(2014). HarvardX and MITx: The first year of open online courses (HarvardX and MITx Working Paper No. 1).

Hone, K. S., & El Said, G. R. (2016). Exploring the factors affecting MOOC retention: A survey study. Computers & Education, 98, 157-168. DOI: 10.1016/j.compedu.2016.03.016

Hood, N., Littlejohn, A., & Milligan, C. (2015). Context counts: How learners’ contexts influence learning in a MOOC. Computers & Education, 91, 83-91.

Hoy, M. B. (2014). MOOCs 101: an introduction to massive open online courses. Medical reference services quarterly, 33(1), 85-91.

Huang, B., & Hew, K. F. T. (2016). Measuring learners’ motivation level in massive open online courses. International Journal of Information and Education Technology. DOI: 10.7763/IJJET.2016.V6.788

Jivet, I. (2016) The Learning Tracker. A Learner Dashboard that Encourages Self-regulation in MOOC Learners (Master thesis, Delft University of Technology, Netherlands). Retrieved from http://resolver.tudelft.nl/uuid:f6c2ede4-a4e3-4ff0-b681-b60d5785e3c

Jordan, K. (2013). MOOC Completion Rates: The Data, Retrieved 27th July 2017, available at: http://www.katyjordan.com/MOOCproject.html

Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. The International Review of Research in Open and Distributed Learning, 15(1).
Jordan, K. (2015). Massive open online course completion rates revisited: Assessment, length and attrition. International Review of Research in Open and Distributed Learning, 16(3) pp. 341–358.

Karnouskos, S., & Holmlund, M. (2014). Impact of Massive Open Online Courses (MOOCs) on Employee Competencies and Innovation. Blekinge Institute of Technology

Kennedy, G., Coffrin, C., De Barba, P., & Corrin, L. (2015, March). Predicting success: how learners' prior knowledge, skills and activities predict MOOC performance. In Proceedings of the Fifth International Conference on Learning Analytics and Knowledge (pp. 136-140). ACM. http://dx.doi.org/10.1145/2723576.2723593

Khalil, H., & Ebner, M. (2013, June). “How satisfied are you with your MOOC?”-A Research Study on Interaction in Huge Online Courses. In EdMedia: World Conference on Educational Media and Technology (pp. 830-839). Association for the Advancement of Computing in Education (AACE). doi:10.17265/2160-6579/2015.12.003

Kim, J., Guo, P. J., Seaton, D. T., Mitros, P., Gajos, K. Z., & Miller, R. C. (2014, March). Understanding in-video dropouts and interaction peaks in online lecture videos. In Proceedings of the first ACM conference on Learning@ scale conference (pp. 31-40). ACM. doi: 10.1145/2556325.2566239

Kizilcec, R. F., & Cohen, G. L. (2017). Eight-minute self-regulation intervention raises educational attainment at scale in individualist but not collectivist cultures. Proceedings of the National Academy of Sciences, 201611898. https://doi.org/10.1073/pnas.1611898114

Kizilcec, R. F., & Halawa, S. (2015, March). Attrition and achievement gaps in online learning. In Proceedings of the Second (2015) ACM Conference on Learning@ Scale (pp. 57-66). ACM.

Koedinger, K. R., Kim, J., Jia, J. Z., McLaughlin, E. A., & Bier, N. L. (2015, March). Learning is not a spectator sport: Doing is better than watching for learning from a MOOC. In Proceedings of the Second (2015) ACM Conference on Learning@ Scale (pp. 111-120). ACM.

Kop, R., Fournier, H., & Mak, J. S. F. (2011). A pedagogy of abundance or a pedagogy to support human beings? Participant support on massive open online courses. The International Review of Research in Open and Distributed Learning, 12(7), 74-93.

Koutsodimou, K., & Tziomogiannis, A. (2016). Mass Open Courses and teacher professional development: design issues and study of participants' views. In T. A. Mikropoulos, N. Papachristos, A. Tsiara, P. Chalki (eds.), Proceedings of the 10th Pan-Hellenic and International Conference “ICT in Education”, Ioannina: HAICTE. 23-25 September 2016. ISSN 2529-0916, ISBN 978-960-88359-8-6, 52-62.

Li, N., Kidziński, Ł., Jermann, P., & Dillenbourg, P. (2015). MOOC video interaction patterns: What do they tell us?. In Design for teaching and learning in a networked world (pp. 197-210). Springer, Cham.
Maldonado, J. J., Palta, R., Vázquez, J., Bermeo, J. L., Pérez-Sanagustín, M., & Munoz-Gama, J. (2016, October). Exploring differences in how learners navigate in MOOCs based on self-regulated learning and learning styles: A process mining approach. In Computing Conference (CLEI), 2016 XLII Latin American (pp. 1-12). IEEE.

Morris, N. P., Hotchkiss, S., & Swinnerton, B. (2015). Can demographic information predict MOOC learner outcomes. Proceedings of the EMOOC Stakeholder Summit, 199-207.

Nawrot, I., & Doucet, A. (2014, April). Building engagement for MOOC students: introducing support for time management on online learning platforms. In Proceedings of the 23rd International Conference on World Wide Web (pp. 1077-1082). ACM. https://doi.org/10.1145/2567948.2580054

Oosterhof, A. (2010). Educational Assessment: From Theory to Practice (Edited by K. Kasiatis). Athens: Ellin

Park, Y., Jung, I., & Reeves, T. C. (2015). Learning from MOOCs: a qualitative case study from the learners’ perspectives. Educational Media International, 52(2), 72-87. doi:10.1080/09523987.2015.1053286

Perna, L. W., Ruby, A., Boruch, R. F., Wang, N., Scull, J., Ahmad, S., & Evans, C. (2014). Moving through MOOCs: Understanding the progression of users in massive open online courses. Educational Researcher, 43(9), 421-432. DOI: 10.3102/0013189X14562423

Pursel, B. K., Zhang, L., Jablokow, K. W., Choi, G. W., & Velegol, D. (2016). Understanding MOOC students: motivations and behaviours indicative of MOOC completion. Journal of Computer Assisted Learning, 32(3), 202-217. doi: 10.1111/jcal.12131.

Ramesh, A., Goldwasser, D., Huang, B,’Daume III, H., & Getoor, L. (2014). Understanding MOOC discussion forums using seeded LDA. In Proceedings of the 9th ACL Workshop on Innovative Use of NLP for Building Educational Applications, 2014. pp. 28-33

Santos, J. L., Klerkx, J., Duval, E., Gago, D., & Rodriguez, L. (2014, March). Success, activity and drop-outs in MOOCs an exploratory study on the UNED COMA courses. In Proceedings of the Fourth International Conference on Learning Analytics and Knowledge (pp. 98-102). ACM.

Schulze, A. S. (2014). Massive open online courses (MOOCs) and completion rates: are self-directed adult learners the most successful at MOOCs? (Doctoral dissertation, Pepperdine University).

Shapiro, H. B., Lee, C. H., Roth, N. E. W., Li, K., Çetinkaya-Rundel, M., & Canelas, D. A. (2017). Understanding the massive open online course (MOOC) student experience: An examination of attitudes, motivations, and barriers. Computers & Education, 110, 35-50. DOI: 10.1016/j.compedu.2017.03.003
Skrypnyk, O., de Vries, P., & Hennis, T. (2015). Reconsidering retention in MOOCs: The relevance of formal assessment and pedagogy. eMOOCs 2015-Proceedings of the Third European MOOCs Stakeholder Summit, 166-172.

Sofos, A., Kostas, A., Paraschou, B. (2015). Online Distance Learning from Theory to Practice. Greek Academic Electronic Textbooks and Aids. Available at: http://hdl.handle.net/11419/182

Stein, R., & Allione, G. (2014). Mass attrition: An analysis of drop out from a Principles of Microeconomics MOOC. Penn Institute for Economic Research, Department of Economics, University of Pennsylvania.

Tawfik, A. A., Reeves, T. D., Stich, A. E., Gill, A., Hong, C., McDade, J., ... & Giabbanelli, P. J. (2017). The nature and level of learner–leamer interaction in a chemistry massive open online course (MOOC). Journal of Computing in Higher Education, 1-21. DOI:10.1007/s12528-017-9135-3

Thille, C., Schneider, E., Kizilcec, R. F., Piech, C., Halawa, S. A., & Greene, D. K. (2014). The future of data-enriched assessment. Research & Practice in Assessment, 9.

Tomkin, J. H., & Charlevoix, D. (2014, March). Do professors matter?: Using an a/b test to evaluate the impact of instructor involvement on MOOC student outcomes. In Proceedings of the first ACM conference on Learning@ scale conference (pp. 71-78). ACM. doi: 10.1145/2556325.2566245

Tseng, S. F., Tsao, Y. W., Yu, L. C., Chan, C. L., & Lai, K. R. (2016). Who will pass? Analyzing learner behaviors in MOOCs. Research and Practice in Technology Enhanced Learning, 11(1), 8.

Veletsianos, G., Reich, J., & Pasquini, L. A. (2016). The Life Between Big Data Log Events: Learners’ Strategies to Overcome Challenges in MOOCs. AERA Open, 2(3). DOI: 10.1177/2332858416657002

Whitehill, J., Williams, J., Lopez, G., Coleman, C., & Reich, J. (2015). Beyond Prediction: First Steps toward Automatic Intervention in MOOC Student Stopout. In Proceedings of the 8th International Conference on Educational Data Mining (pp. 171-178).

Whitmer, J., Schiorring, E., & James, P. (2014, March). Patterns of persistence: what engages students in a remedial English writing MOOC?. In Proceedings of the Fourth International Conference on Learning Analytics and Knowledge (pp. 279-280). ACM. doi: 10.1145/2567574.2567601

Wilkowski, J., Deutsch, A., & Russell, D. M. (2014, March). Student skill and goal achievement in the mapping with google MOOC. In Proceedings of the first ACM conference on Learning@ scale conference (pp. 3-10). ACM. doi:10.1145/2556325.2566240

Wong, J. S., Pursel, B., Divinsky, A., & Jansen, B. J. (2015, March). An analysis of mooc discussion forum interactions from the most active users. In International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (pp. 452-457). Springer, Cham.
Xiong, Y., Li, H., Kornhaber, M. L., Suen, H. K., Pursel, B., & Goins, D. D. (2015). Examining the relations among student motivation, engagement, and retention in a MOOC: A structural equation modeling approach. Global Education Review, 2(3).

Yuan, L. & Powell, S. (2013). MOOCs and Open Education: Implications for Higher Education. Glasgow: JISC CETIS.

Zheng, S., Rosson, M. B., Shih, P. C., & Carroll, J. M. (2015). Understanding Student Motivation, Behaviors and Perceptions in MOOCs. Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing - CSCW ’15, (pp. 1882-1895). https://doi.org/10.1145/2675133.2675217.

Zutshi, S., O’Hare, S., & Rodafinos, A. (2013). Experiences in MOOCs: The perspective of students. American Journal of Distance Education, 27(4), 218-227. DOI:10.1080/08923647.2013.838067.
